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Sin Hang Boon . . . new services

Singapore well ahead with ISDN services

By Noel Bennett

SINGAPORE — The growth in demand for ISDN services is not expected to take off until two to five years hence, but Singapore Telecom believes it can usher in a whole new range of services for users, according to Sin Hang Boon, divisional manager, Data Services.

Telecom introduced the ISDN service last December, now

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Telecom apostles plugging the vendors' sacred book of ISDN

By Noel Bennett

SINGAPORE — Asia/Telecom 89 demonstrated that while things change, essentially they remain the same. In place of the missionary of the faith we now have the apostles of telecommunications with the sacred book, ISDN, and in place of the merchants, we now have the vendors. Strategic alliances seem to be replacing the army.

As the Singapore Minister for Communications and Information and second Minister for Defence (Policy), Dr Yeo Ning Hong, said in his opening speech before some 1000 distinguished guests in the cavernous conference hall at Raffles City:

"In the world of business and finance, modern communications have made it easier for corporations to set up operating centres and manufacturing plants all over the world."

Yeo also said, underlining this point: "Every operation from R&D through to manufacturing and marketing takes place in the location best suited to help the companies improve their efficiency and increase their productivity."

That is, a nation's telecommunications structure will be an important determinant of investment.

Taking advantage of this "telecommunications equals economic growth" equation, some 263 companies were represented on 136 stands. They came from 29 countries, filling 4000 sqm of exhibition space with the gospel spread to the more than 2000 delegates.

While the giant companies from the US, Japan and Europe exhibited as separate entities, other exhibitors grouped themselves under their countries of origin — Canada, Italy and Australia, for example.

Asia/Telecom was jointly sponsored by Singapore Telecom and the International Telecommunication Union (ITU) under the theme of: "Moving into the Information Age: Integrated Telecommunication Services and Networks."

Again touching on the role of telecomms and economic growth, the secretary-general of the ITU, Richard Butler, in his opening speech, said: "Certainly, it is an open secret that a large part of the economic success of the Republic of Singapore is due to the exemplary telecommunications systems of this country, where ISDN has become already a public telecommunications service."

However, Butler drew attention to those who had missed this change: "This region (Asia/Pacific) is served with no more than some 100 million telephones, or an average of three telephones per 100 people."

Legal aspects

However, there are signs of improvement, with Indonesia, for example, announcing that it has placed an order for a Vsat satellite link serving as many as 4000 sites.

The well-attended technical sessions were given over to digital networks, mobile radio communications, networking, ISDN, new satellite services and thin route communications, and moving into the telecommunications age.

Panel sessions were also held about the World Administrative Telephone and Telegraph Conference (WATTC) and legal and regulatory aspects of world telecommunications.

This conflux of vendors from all around the world, delegates from many countries and technical ways being developed to help the underdeveloped nations gives a certain point to the concept of a global society — given added weight by Asia/Telecom 89 being held in Singapore, a city so dependent on mass tourism and conventions.

Governments' communications role growing

By Noel Bennett

SINGAPORE — One of the challenges inherent in the growth of technological development was how it would impact national sovereignity and cultural diversity, the Minister of Transport and Communications, Ralph Willis, said at the Asia Telecom 89 conference.

Satellite systems, competing with the international carrier, Intelsat, where signals could be broadcast across national boundaries, was one example of such concerns, he said.

Willis was speaking on Sharing a Common Resource: Modern Telecommunications Networks and Services to Accelerate Development of ~~the Asia~~-Pacific Rim.

His speech was made in the final session of the conference. Previously, he had visited the Australian exhibition. Willis said the Federal government was aware of the issues, both domestic and international, such as the availability of technology for under-developed nations, frequency allocation and the increasing ability to bypass traditional telecommunications carriers.

Governments, realising that monopolies were not necessarily a guarantee of good service, were now taking a greater role in telecommunications, not leaving such matters entirely in the hands of carriers.

The Australian government, for its part, had given greater flexibility and more commercial focus to Telecom Australia, OTC and Aussat. Results of this action so far had been "encouraging".

Australia was also directing attention to the international en-

(Continued page 2)

Reactions of 21 sub-contractors to Desine vary from expressions of delight to quiet caution

By Noel Bennett

CANBERRA — Reactions by vendors of communications products chosen for the Department of Defence's Desine project, estimated to involve expenditures of $A400 million over the next five years, range from the delighted to the cautious.

Joining IBM Australia as the prime contractor are 21 sub-contractors, including seven companies in various aspects of the communications business. The seven are: Case Communications Systems, Eracom Pty Ltd, Integral Fibre Systems, JN Almgren, NetComm, Software Developments and System Technology, now NetLink.

Following the decision, various sections of defence will be able to choose companies from this basket of IBM and the 21 sub-contractors without having to go to tender. Other Federal government departments have followed similar procedures with purchases of services and equipment.

Accordingly, the selected Desine vendors are in the dark as to what business they will obtain from their inclusion until actual orders are placed, leading to a cautious approach by some vendors.

NetComm's Chris Howells said while it was a good opportunity for the company, no indication had been given as to what kind of money was to be spent — it was not a case of saying there would automatically be money in the bank.

The Desine project was another instance of the Federal government trying to build local industry by sourcing equipment and sources from Australian manufacturers.

However, Howells said he believed it was too easy as in the past, such as with the offsets scheme, for such obligations to be avoided. Accordingly, the Federal government should be more aggressive in ensuring the corporate partnership scheme worked.

However, NetComm was more than confident it could meet both the technology requirements of Desine, the necessary levels of quality control and be internationally competitive in price.

Howells said NetComm did not bid under the IBM umbrella, but was included in other prime contractor bids as well as bidding on its own behalf.

Barry Foster from Case Communications Systems said he did not know as yet what the outcome would mean in terms of orders, but added that the inclusion was "very prestigious".

A spokesman for JN Algren said the inclusion showed its products could stand up internationally both in performance and price and the company was "very happy" to be on the list.

John Robinson, founder of Software Developments and developer of the Net/Master network management system, was perhaps the most exuberant and

(Continued page 3)

Robinson scores a double with Desine and Galileo

SYDNEY — John Robinson has scored two winners almost simultaneously — being included in the Department of Defence Desine project and with his product, Net/Master, being chosen for Galileo, a consortium comprising 10 European international airlines.

Net/Master, sold and marketed in the US by Cincom Systems will be part of a global network capable of handling up to 1000 transactions/second by 1990.

Reportedly, the product was chosen over IBM's NetView and two others for its ability to integrate problem change management with operational control. It will be used to manage Galileo's IBM SNA network.

Robinson said it was a very high profile win and every win was critical to create a ripple effect in the market place.

Net/Master will be installed at Galileo's new switching centre in Swindon, England. By August next, the centre will hold six IBM 3090 Model 280 mainframes linked to more than 9000 IBM Personal System/2 Model 50s located in thousands of travel agencies throughout Europe.

All airline enquiries and reservations will be switched through the Galileo centre, with links to each airline's own IBM installation in major cities.

John Robinson . . . winner

Digital voice transmission shows rapid growth

SYDNEY — The telephone was once just that — one person speaking to another — but now, thanks to new technologies, voice can be transmuted into voice mail, to provide input to a computer, to use the "thumb print" inherent in voice to provide security systems and voice itself can be generated artificially.

International Data Corp, of the US, reports that some of these markets have been growing by up to 40 per cent a year, driven by reliable products, cheaper and more powerful computing power and a growing appreciation of appropriate applications.

Further, in the US, clearer digital voice transmission — in Australia, ISDN? — will improve the performance of some products and the Bell companies and information suppliers will create a demand for products which will fuel further technical improvements, IDC said.

The 50-page report breaks down the particular technologies and their applications, decribes them, indicates future directions and tables the vendors of pertinent products.

The three basic voice processing technologies are said to be; speech digitisation, speech recognition and text-to-speech or speech synthesis. They use two forms of speech representation, speech as digitised sounds or speech converted to text.

Speech digitisation, converting speech from an analogue to a digital signal and vice-versa, can be used in speech transmissions, for voice mail and to guide a user through simple, predictable procedures.

Speech recognition and text-to-speech are technologies for computer input and output respectively. They convert speech to and from a text representation.

The IDC report says that of these technologies, speech digitisation is by far the dominant technology commercially with the enduser market value accounting for about 95 per cent of the voice processing market, a global market estimated to exceed more than $US1 billion for US vendors in 1988.

On the other hand, speech recognition and text-to-speech have been applied to niche markets, limited, at present, from participating in more widespread and universal application. However, the technologies are the subject of research and development efforts.

The report says speech digitisation has been applied extensively to many applications.

Enquiries on the report to: IDC Research Australia, 56 Berry Street, North Sydney 2060. Tel: 922 5300.

Ralph Willis . . . greater flexibility

Governments taking greater communication role says minister

(Continued from page 1)

vironment — one example among many being its support for the Asia-Pacific Telecommunity and providing $A2.6 million to help OTC International to establish a network for South-West Pacific nations.

Also, OTC International and Telecom Australia International were providing technological transfer and training in countries such as Vietnam and Saudi Arabia, respectively, and where these organisations had won contracts.

An official on the OTC(I) stand said the organisation was looking for business and possible joint ventures. OTC(I) was not pretending it was a Japanese giant, but Australia was located within the region and had a great deal of experience here.

Also, OTC(I) was interested in determining what other organisations were doing in the region.

A Telecom Australia (International) official said following its bid, in concert with Australian manufacturers, for the Thai optic-fibre and microwave digital transmission network, it was now recognised as a creditable organisation, even though it did not win the contract.

As associated contract for network management had not yet been decided. TA(I) had also bid on this contract.

The official stressed that not only did TA(I) and Australian manufacturers have the technical capability to win such contracts, but they also could provide the necessary "soft-loan" financing through Austrade.

As TA(1) had been "very close" to winning the main Thai contract, so it also was well placed to win a contract in Pakistan in a joint venture with Olex Cables. The contract involved a high-capacity, long-distance fibre optic network.

Also on the Australian stand were QPSX Communications, designer and developer of the highly innovative and acclaimed high-speed MAN, Alcatel-STC Australia which was showing the Touchphone 200 telephone handset and the Commander small business system, Philips Radio Communications (Australia) with mobile radio and paging systems and Kingfisher International which introduced its new K1020 series fibre optic "talk" sets, designed for installation and maintenance personnel.

On an adjoining, but separate stand, AWA Communications was displaying digital microwave equipment, PCM multiplexers and program sound interfaces.

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NEWS

briefs

Competitive apostle

SYDNEY — Tom Carter, leading US apostle for open competition in telecommunications, will be the guest speaker at Atug 89, to be held at Darling Harbor from April 18 to 20. Other leading speakers include Rolf Ungermann, of Ungermann-Bass, and Ron Mathews, of ICL UK and prominent in the push for European standards. Atug is hoping for some 700 registrants, 614 registering last year.

Meanwhile, exhibition organisers, Riddell Exhibition Promotions, said the present 74-75 exhibitors could go up to 80.

Imagineering scores

SYDNEY — Imagineering Technology Ltd has announced it has exclusive distribution rights to 3Com's Enterprise Division Products (ESD), formerly Bridge Communications. Australian distribution rights for ESD were formerly held by Network Solutions Australia Pty Ltd.

The change in distribution was made in the light of Imagineering already carrying the full range of 3Com products, the company said. Network Solutions will be one of Imagineering's major resellers of 3Com products, including ESD, according to Imagineering.

Funding for centre

MELBOURNE — Telecom is funding to the tune of $900,000 over three years a Centre for Expertise in Distributed Information Systems through the University of Queensland's Centre for Information Technology Research (CITR).

The funding will allow the university's Computer Science Department to expand its research and development into distributed information systems. Telecom said the eventual benefit for itself and customers would be in enhanced telecommunication services and highly efficient network management.

Unisys for Disnet

MELBOURNE — Telecom Australia will use Unisys workstations as part of its Australia-wide Distributed Information Systems Network (Disnet). The Unisys equipment, estimated to cost about $A21 million, will be supplied over a three-year period and will provide access to mainframes, minicomputers and personal computers.

While the wide implementation of Disnet had been expected to begin this year, user demand and the introduction of a major system resulted in the installation of more than 100 terminals and 50 Lans by the end of last year.

AEI review

MELBOURNE — The International Standards Organisation (ISO) will review standards for Automatic Electronic Identification (AEI). This follows representations by Australian officials who argued against basing the standard on a single patented technology. This review could result in Amskan Ltd, a Melbourne-based listed company, being able to compete against Amtech Corp, of the US, the supplier of the technology on which the projected standard was based.

Little joy for Telecom or its competitors in court decision

By Noel Bennett

SYDNEY — Legal opinions would indicate that neither Telecom nor would-be competitors will have received much comfort from a recent High Court judgement that large companies cannot refuse to supply competitors.

With such an important decision, it will take time for the legal fraternity to think through its legal ramifications and whether the particular case and the grounds on which it was considered will be of relevance to the telecommunications industy and its relationships with Telecom.

In what has been described as a "landmark decision", the High Court has effectively given greater strength to the interpretation of Section 46 of the Trade Practices Act by finding that the section covered those cases where a company had used its monopoly position in the market place to block another entrant.

In the decision, the High Court found that BHP had taken advantage of its market position to not supply a competitor, Queensland Wire Industries, with steel for fencing, supply being controlled by a BHP subsidiary.

In the Federal government's May statement — Australian Telecommunications Services; A New Framework — it was stated that the monopoly of the basic public switched voice network by Telecom and OTC would continue.

Also, "that the shared use and resale of simple carriage of all traffic over private networks will continue to be restricted. This restriction will apply both to facilities leased from Telecom and OTC and to services obtained from Aussat."

The contents of the May statement are contained in legislation, expected now to be tabled in Federal Parliament during April.

The legislation also contains provisions for the establishment of Austel, an independent statutory body, which will, so far as "practicable", undertake all regulatory tasks associated with telecommunications and will, inter alia, ensure that goals relating to "fair and efficient competition" are achieved.

Those who argue for greater competition in the telecommunications industry, either from private industry or organisations, including carriers, believe the following services should be allowed:

■ That organisations can establish their own private networks, independently of the present carriers. Those operated by railway systems are a convenient example as is the Mercury network in Britain.

■ Such networks should be allowed to interconnect with the public switched telephone network, with the fee paid to the carrier being based on commercial rates and not on the position of the carriers to take advantage of their monopoly position.

■ Entrepreneurs should be allowed to lease lines from the carriers for use by any one who wishes to participate and again with the ability to connect commercially to the PSTN.

The point now exercising the minds of the legal profession is whether Section 46 of the TPA, as interpreted by the High Court, offers grounds to appeal against the monopoly provisions contained in the pending legislation, which in these instances merely restates the restrictions which have traditionally existed.

Some difficulties for commentators are that the High Court was considered to be taking a moral stance in interpreting the section and, also, by basing its decision solely on the particulars of the case before it, did not make a judgement which could be conveniently interpreted as having relevance outside this case.

While the effects of the judgement as to the ambit of Section 46 may not be "crystal clear" at this stage, courts, as with other organs of society, are subject to change over time. For example, whether legislation should be interpreted according to what is thought it was indeed saying or according to what it was trying to say, taking into account new social conditions and climates which did not exist when the legislation was framed.

Future judgements of courts and actions by Austel could increasingly affect the intention of the government to accord the carriers their "reserved powers".

NTT 'to work hard' to reach $US100m in overseas revenue

By Noel Bennett

SINGAPORE — Nippon Telephone and Telegraph (International) would work "very hard" to gain more business internationally, according to the president and chief operating officer, Ichiro Yamanouchi.

NTT(I)'s revenues had grown from $US16 million in 1987 to $US50 million during 1988 and was expected to jump to $US80 million this year, but as this was "not so big a jump", the corporation could reach $US100 million in overseas revenues, he said.

NTT, Japan's national carrier, was privatised in 1985 and has sinced faced increasing competition.

NTT now had to consider competition when thinking of increasing charges and had rationalised both its management and work force as well as turning its attention to foreign markets where it could provide consultancy and other services, he said.

Yamanouchi said that under the Japanese business law recently enacted, competition was now allowed in every area of telecommunications and two new competitors planned to launch satellites during this spring and summer.

Asked what advice he could give in the "likelihood" that Singapore Telecom would be privatised, Yamanouchi said the carrier provided a very good quality network, was actively introducing new services and kept charges low.

However, users should contribute to any decision to introduce changes and Yamanouchi said he personally believed that monopoly was not always a good thing and there might be room for competition in some areas of Singapore Telecom's operations.

NTT had introduced ISDN services some nine months ago and as at December, subscribers numbered about 200, taking up about 1000 circuits.

This demand was lower than expected. Yamanouchi said he was "not worried", as the ISDN network only covered 26 cities at present and subscribers had to make necessary preparations before they could be connected.

Singapore well ahead with ISDN services

(Continued from page 1)

covering about one-third of the country from out of eight Fujitsu-equipped exchanges. The service is concentrated in the business and manufacturing zones.

Sin said that from a supply viewpoint, manufacturers were hesitant to engage in full production at this stage until they knew that demand was forthcoming worldwide and that standards had been firmly established. Users were also concerned with standards and the obsolescence of existing equipment.

ISDN was more than the integration of existing services, marking the integration of computer power and communications. Also, ISDN would change the essential operations of telecommunications authorities, he said.

These authorities would be supplying the highway, and how the user took advantage of these facilities, "we do not know and do not care".

That is, the user could be using the highway for any mix of communications, voice, data and facsimile, according to his perceived best business interests.

Further, ISDN would allow many more new players into the marketplace, providing many more services than the telecommunications authorities would normally do on such a network.

These new services could include electronic mail, information services and hi-fi music transmission over this one network. However, it would take time for the vendors to be convinced of these market opportunities.

Sin said that as opposed to mass market services, such as videotext, ISDN was slated towards larger applications and defined markets. Also, for users, ISDN provided a more economical method of ready access to backup networks than existing alternatives.

On standards, Sin said that while CCITT was the standards organisation, many regional groupings were trying to influence their PTTs to accept their way of thinking and so affecting the CCITT standards.

In the absence of complete standards, Singapore had obtained an agreement from its suppliers that once CCITT introduced these standards, the manufacturers would make their equipment compatible.

"Ultimately there will be one standard, but this would be a long-term process," Sin said.

Adding to the 200,000 to 500,000 lines of digital switching equipment already bought from Fujitsu, Telecom was now proceeding to evaluate tenders for another 300,000 lines and Telecom "may end up with another supplier", Sin said.

Reactions to Desine project variable

(Continued from page 1)

positive of those suppliers contacted and who responded.

Robinson said defence had undertaken a very thorough investigation of the alternatives available and for Net/Master to be chosen was not only an endorsement of this product, but he was "very pleased" to see so many other Australian companies had been successful.

These choices, in turn, indicated that the Federal government was serious about Australian content.

Desine was a "very prestigious" account, both technically and as it concerned Australia's defence.

Net/Master directly competes with IBM's NetView and an IBM spokeswoman said if the department chose Net/Master for a particular project, then IBM, as the prime contractor, would "be happy" to instal it.

On the requirement for OSI facilities, IBM said it had a quite comprehensive range of products which complied with these standards — as far as they had been established — and while it would continue to support its SNA customers, it was "very committed to OSI".

NEWS FROM ASIA TELECOM 89

Scientific-Atlanta lands $US6 million contract to supply B-Mac satellite technology to Japan

By Noel Bennett

SINGAPORE — Scientific-Atlanta Inc, has secured a $US6 million contract with Japanese companies to supply B-Mac satellite technology.

This technology, used to ensure security of video audio and data signals transmitted and received via satellite, was first tested in Australia during 1982-83, using the Aussat satellite.

Closer to home, the corporation has sold a satellite-based network linking up some 4000 remote sites to Indonesia's Ministry of Telecommunications, Perumtel.

The initial contract, shared between the corporation and Citri Sari Makmur, an Indonesian company, is valued at $US10 million and will exceed $US50 million when the network is fully implemented.

In Japan, five companies, including Nippon Telephone and Telegraph, will use the B-Mac technology to establish private business television network, using JC-Sat, Japan's new communications satellite, due to be launched at the end of February.

The Indonesian turnkey Skylinx.25 network includes master earth stations and remote site terminals comprising digital satellite modems and 1.8m Vsat antennas with network control software included in the system's packet-switch transmission.

While this network will operate independently of Indonesia's public packet-switching network, it will be able to connect into the public network which services Indonesia's five largest cities.

Skylinx.25 will operate via Indonesia's Palapa satellite and as this satellite also covers neighboring nations, these countries might be interested in networking with Indonesia, according to a spokesman for Citri Saru Makmur.

The company had received enquiries from people interested in connecting computers in remote cities to major cities elsewhere in the region. Representatives of the oil, mining, forestry, banking and transportation industries had also expressed interest in using Skylinx.25.

A Scientific-Atlanta spokesman said the company would be interested in helping to set up private networks elsewhere, where allowed, had an application to establish B-Mac and Vsat technology in Singapore and would be visiting Australia soon to meet Aussat officials about the potential of introducing new services such as Pay TV.

Butler decides against another ITU term

SINGAPORE — Richard Butler, secretary-general of the International Telecommunications Union, and on secondment from Telecom Australia, was visibly moved after the announcement that he would not be seeking re-election for another term.

Making the announcement, Werner Wolter, executive director of Asia Telecom 89, said: "Butler was among the top twenty-five telecommunication leaders in the world during 1988."

Wolter said he had been working with Butler for 25 years, and paid tribute to Butler's effective work in achieving so much consensus and compromise among nations which often took strikingly different attitudes towards telecommunications issues.

Wolter said that if Butler had sought re-election "there would have been no doubt that he would have been re-elected".

After the announcement, Butler began his opening speech to the conference slowly, obviously trying to keep in check his personal disturbance following this announcement before so many leaders of the world's telecommunications fraternity.

Butler said in private that although he had been firmly encouraged by the Australian Federal government to seek re-election, he was now 63 and another seven years would take him out to 70 years of age — he wanted to return to Australia for these years.

Also marking the end of another era, Dr Kobayshi, chairman emeritus and representative director of NEC, was awarded the ITU Certificate of Merit, in tribute to his pioneering work in the field of international telecommunications.

Data General cracks 'the very, very big one' at Telecom 89

By Noel Bennett

SINGAPORE — "We cracked it, we cracked the very, very big one," said a euphoric Wayne Fitzsimmons, a vice-president of Data General Corp. Although he would not disclose the customer and the amount involved, Fitzsimmons, who once headed Data General in Australia, said it involved many millions of dollars.

Not that the signing of the contract was done on the spur of the moment at the exhibition — it was the culmination of much earlier effort.

However, Fitzsimmons said this event underlined the importance of investing heavily in an exhibition stand at such prestigious events as Asia Telecom 89 to give a marked sense of "presence".

Data General which sells minicomputers — "more Mips for less money" — had now recognised that customers were requiring distributed applications. With their PCs, customers wanted to do everything and gain easy access to the "world", he said.

Accordingly, the corporation was concentrating more heavily on Lans and Wans to give the customer what he required — and it was not Mips as in the "old days" but an integrated, intelligent network which could seamlessly combine all applications which could operate independently of the mix of machines and their software.

Wayne Fitzsimmons . . . deal involved many millions

Instead of emphasising differences in operating software and other proprietary products, Data General was joining the world of standards with, for example, the announcement due to be made in San Francisco soon of the company's first Unix products.

Data General was embracing all emerging communications standards — ISDN (all flavors), OSI and SAA, which, although being an IBM proprietary product, would be used by 50 per cent of the world's computer installations, Fitzsimmons said.

Building on its previous Comprehensive Electronic Office (CEO) connectivity effort, the corporation is engaged in a joint venture with Singapore Telecom to develop the Public Office Automation System which was on display at Asia Telecom 89.

This system will ultimately provide value-added services such as X.400-based electronic messaging, filing, document conversion network management and facilities management and accounting on nation-wide networks.

briefs

Telesat aids AsiaSat

SINGAPORE — Asia Satellite Telecommunications Co Ltd (AsiaSat) has reached an agreement with Telesat Canada for the provision of engineering and management consulting services for the AsiaSat satellite system.

Telesat Canada will use its expertise gained since pioneering domestic satellite communications 18 years ago and ongoing work since in this discipline to implement the AsiaSat project.

This project will begin with the launch of the AsiaSat satellite on board a Chinese rocket in April, 1990. The satellite will serve such countries as China, Thailand, Pakistan and others in the region.

AsiaSat, based in Hong Kong, is a joint venture between Cable and Wireless, China International Trust and Investment Corp and Hutchison Whampoa Ltd.

Openings for suppliers

SINGAPORE — While Austel would be concerned with several contentious issues, the transformation of the Australian telecommunications industry over the next three years should create important opportunities for private suppliers.

In a paper prepared for Asia Telecom 89, Gerald Wakefield, Baker and McKenzie, Sydney, said issues facing Austel would include:

- Definition of closed user groups
- The industry development arrangements which would determine which companies were accorded authorised supplier status.
- Delineation of the boundary between "reserve services" and competitive (value added) services.

He said that the reservation of domestic ISDN to Telecom control would make provision of private networks redundant and increase costs to business users.

The Federal government's May statement did not consider the implications of this monopoly adequately nor the likely impact of ISDN.

Due to the protection likely to be accorded by legislation to "reserve services", there would appear to be little scope for Austel to limit the ambit of that monopoly, Wakefield said.

Collaboration in NZ

SINGAPORE — Bell Atlantic International and IBM are collaborating to instal IBM's Information Service System, a computerised directory assistance system, for New Zealand Telecom.

IBM will provide the carrier with the system and its associated equipment while Bell Atlantic International will support the installation and train personnel.

The system was demonstrated on IBM's stand at Asia Telecom 89. The two companies also used the stand to present the Intelligent Network, following a study by the two companies, together with Siemens, which identified five Intelligent Network services as having high growth potential, worldwide.

Rules need changing

SINGAPORE — Mobile communications could only reach its full potential if "enlightened" regulations, both technical and economic, were introduced, according to the managing director of Link Telecommunications Pty Ltd, Terry Winters.

Addressing a panel session, The Economics of Mobile Radio, Winters said: "The combination of deregulation, high demand for mobile information transfer and availability of cheaper mobile communications technology has created a new mobile communications industry, almost unrecognisable from that existing at the start of the decade."

The high level of usage of both paging and traditional land mobile radio in Australia stemmed primarily from the demand for improved personal productivity and general life-style benefits, he said.

In the US and the UK, cellular radio users numbered about eight per thousand population, compared with about two per thousand in European countries where monopolies prevailed. Link, South Melbourne, is a subsidiary of BellSouth Enterprises.

Reasons for failure

SINGAPORE — Regarding telecommunications and computers as separate and unrelated elements of the global information infrastructure was perhaps the main reason for failing to reach international agreements on technology, standards and regulations, according to the president of Nynex International, Dr Eugene Sekulow.

Speaking at Asia Telecom 89, Sekulow said other reasons for failure to reach agreements included nationalism, parochialism, fear and greed.

Computers and communications were becoming more and more important to the economic growth and development of many nations and the industry faced the challenge of making it far easier for these elements to work together.

Meanwhile, Nynex and Telecom Singapore have signed a co-operation agreement to explore joint projects such as marketing and technical studies and exchange of personnel.

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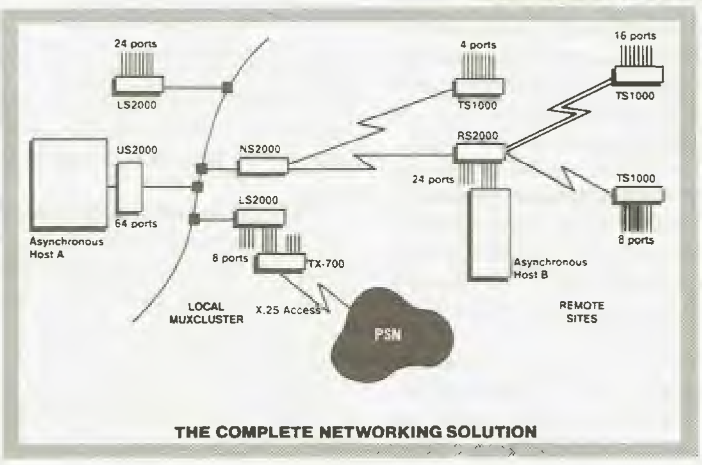

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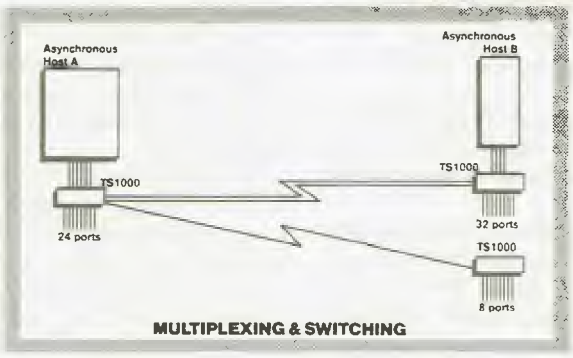

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DPX 2

ETHERNET IS A XEROX TRADE MARK

OPINION

Australian striptease did little for our communications image

By Noel Bennett

SINGAPORE — Australia stood naked at the prestigious Asia Telecom 89 event, wearing a few fig leaves to attract the several thousand delegates, some 900 coming from overseas. In comparison, other countries such as Canada, Italy and Korea were resplendent in their presentations.

Adding to the pang of anger and frustration, is the knowledge that the world is rapidly forming itself into large trading blocks, such as the freeing up of trade between the US and Canada and the trade barrier-free European Community, due to begin in 1992. Nor is there any comfort to be founded in the proposals made by Prime Minister Bob Hawke for Pacific Rim trading co-operation during his recent visit to Asian countries. Influential Singaporean authorities are describing the proposal as virtually "pie in the sky".

Under the Australian banner at the exhibition were Telecom Australia International (TAI), OTC International (OTCI), QPSX Communications Ltd, Alcatel STC Australia, Philips Radio Communications Systems (Australia) and Kingfisher International. AWA Communications had an adjoining stand.

The Australian exhibition was poorly sited with little passing traffic, was cramped in space and overall, could have been completely overlooked by those delegates and others not assiduously looking for the stand. It had no presence.

Canada, on the other hand, comprised some 17 indigenously owned companies, the stands were generous in their use of space and were easily visible to any visitor.

An official of the Australian Trade Commission in Singapore while saying that the display was "disappointing", said space had been rationed and the location of the stand was out of Austrade's hands.

Further, it was up to companies themselves as to whether they should participate or not. This was not the only communications exhibition in this area and companies had participated in these. Austrade's budget was limited and had to cater for requirements of other industries the official said.

A Canadian official said his government had recognised South-East Asia as having greater potential for exports than Europe and hence was focusing its attention of these areas.

He said the present time was one of global alliances for as opportunities escalated, so must companies become larger to participate. On the free trade between Canada and the US, the official said many "interesting" mergers were taking place to effect greater efficiencies and so be well placed to address the world markets.

On the call by Hawke for the creation of an "institution" to encourage greater co-operation among countries in the Pacific, *The Straits Times*, said to reflect Singapore government thinking, stated in a very long editorial: ". . . as of now, the possibility of a body grouping together countries in the Pacific still appears far-fetched.

"Asean should be careful not to be distracted by such a distant possibility. It should harness its co-operative energies to strengthen intra-Asean ties. The six should strive earnestly to make Asean a cohesive economic force in the world."

However, the newspaper does add that although the immediate prospects for a Pacific grouping appear "dim", Asean should not rule it out altogether. Such a grouping might become economically viable by the turn of the century.

Accordingly, Australia also appeared to be naked in terms of free trade areas and so it was more important than ever that with such influential events as Asian Telecom 89 it should be vigorous, bold and enterprising.

Purists might argue that a striking and very visible exhibition is not necessary for those who know what they are after.

However, the giants of the telecommunications world, the NTTs, Fujitsus for example, have not needed such an argument. Their displays were magnificent.

The above remarks are addressed to the Australian government and telecommunications industry and not to those organisations who did raise the flag.

The future challenge for Australia is how to achieve the cohesiveness and drive necessary for success in world trade and at the same time, retain in full our often taken-for-granted fundamental liberties.

A house divided

OUR industry has two problems with implementing inter-connectivity standards: vendors and users. Such standards, officially agreed upon by international associations of users and vendors, have little support in the real world. No enforcement mechanism exists to push or pull information industry companies into accepting and implementing similar communications methods for their products.

The result, of course, is chaos among users and a strong market for third-party communications software. But such software is a makeshift solution to a major information hemorrhage.

How much time and money are lost by companies around the world when they can't send database files from one user's microcomputer or when their mainframes are unable to download to microcomputers located in several different cities?

At today's level of technical sophistication, it should be possible to link computers anywhere in the world at any time and simply let them work together. Vendors' short-term tunnel vision is keeping the global village in the thatch hut and smoke signal stage.

Witness the latest storm raised by major US vendors over "restrictions" on private computer networks in Japan. The Japanese Post, Telegraph and Telephone administration recently proposed that all value-added networks (Vans) in that country conform to X.75, currently used around the world by AT&T and most European Vans and PTTs.

But rather than support such an important move to standardise — Japan is one of the world's largest users of communications services — several US private network suppliers and the US Department of Commerce attacked the idea as protectionist.

Lowell Ravesloot, director of telecommunications for IBM, was quoted as saying, "To require international standards is one way to slow down US companies and allow native providers time to catch up."

But all blame cannot be laid at the vendor's feet; users must shoulder their share. Rather than raising a grass-roots rebellion and forcing vendors to comply with standards, users are finding it easier to "go along to get along".

Stories abound of users — including Fortune 100 companies — that shrink from buying communications equipment from a second vendor to avoid angering their primary vendor and losing its support. Imagine not buying a Toyota for fear of voiding the service contract on your Ford.

Standards efforts by users and vendors alike should be met with what they deserve: support and recognition, But for real progress to be made, the user community must learn to put its money where its mouth is and use economic pressure to force vendors into accepting workable international standards.

Such pressure can easily be applied via requests for proposal that insist on international standards compatibility, as well as actions by users groups and industry associations.

Standards are needed and available. It is up to everyone to make them work.

LETTER TO THE EDITOR

From Michael Gordon
BIS Mackintosh Limited
Luton, UK

IN your February, 1989, issue you reported that the international telecommunications consultancy, BIS Mackintosh Limited, favored the European standard, GSM, over the US standard for the introduction of digital cellular radio (DCR) in Australia.

This indeed was the substance of information that we supplied to you through our Australian representative. However, I should like to revise this opinion.

The US did not agree on a digital standard until the fourth week in January. It was not until then that the Cellular Telephone Industry Association (CTIA) finally agreed to adopt the Ericsson TDMA specification as a digital standard.

This is an indication of the extremely rapid development of this marketplace.

Now that the US industry has made its move, it is worth pointing out that the US standard will have the principal advantage in Australia of permitting overlaying digital cellular alongside the existing analogue AMPS system using the same frequency.

Therefore, based on speed of implementation and the availability of frequency, the US digital standard could well be the logical direction for Australia to proceed.

All equipment would be fully compatible in the US and Australian markets, allowing export opportunity to the US for Australian companies.

A switch to the European GSM standard would effectively require the introduction of an entirely parallel technology and reduced prospects for export.

It could also entail a significant drain on the Australian balance of payments through the import of expensive equipment.

The US digital standard will have exactly the same advantages as the European standard; principal among them that it will reduce congestion.

It is worth repeating that the frequency spectrum which would be used by DCR based on the GSM standard is already in use in Australia.

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IDG COMMUNICATIONS

CAB AUDIT

OPINION

Telecom service changes not restricted to business — some apply to homes

COATES' NOTES

By Stephen Coates

THE May (1988) telecommunications services document included a number of changes that took effect on January 1. These include a new industry arrangement for the supply of customer premise equipment (CPE), a new definition of the boundary between the network and the CPE and a liberalisation of CPE maintenance. By and large, the industry is fully abreast of these changes.

But the changes that took effect on that date were not restricted to business telecommunications — a number of changes apply to residential service.

First of all, the handset market is largely deregulated. Until recently, handsets for sale by private suppliers had to have two significant features. Telecom was, of course, exempt.

> *Telecom's report will recommend that a phoneless residential service cost about $100 a year*

This change will also mean that the featureless analogue handset sold by a major PABX supplier will no longer be classified as system integral.

Why anyone would want to buy a featureless handset, especially when a number of moderately featured handsets are available at the same price, is beyond me, but now you can. And not just at the office, at home as well!

Residential cabling has also been deregulated. So now, before installing the parallel socket in the study, kitchen or spare bedroom yourself, you need to obtain a licence.

Another change applies to the Phaxswitch which David Hartley's Banksia Information Technology will shortly be selling. This product will be given a new regulatory classification, but Telecom will not be taking six months to decide what effect it will have on business or how they can sell one of their own first.

Yet another positive change is that when announcing new telephone numbers, Telecom staff are now allowed to use the word "triple".

But one very necessary change that has yet to take place involves Telecom's attitude towards DTMF (tone) signalling. Despite the fact that the majority of exchange switches in the major cities can support DTMF, the clerks at the TBOs regard it as a big secret. Not only will they never offer it to a residential subscriber who does not ask for it, they even tried to discourage its use by a mate who was being given a line on an AXE exchange!

A senior official of Telecom, who I won't embarrass by naming, informed me that DTMF signalling was not promoted because of a planned migration to MFC signalling! Has anyone seen an MFC handset?

One requirement of the ministerial statement was that Telecom was to report on an alternative to the first phone with supplementary residential exchange services. Telecom did, but won't comment. A spokesman for Ralph Willis said he would, but didn't.

Telecom charges $147 per annum for basic residential service, and $46.50 per annum for an extra handset. Thus, if this report is worth the paper its written on, it will recommend that a phoneless residential service cost about $100 a year.

Road to nowhere

You have probably heard the ad. The one where the boss is chiding the employee for being late to work, and she explains the traffic jams are getting worse, even though she leaves home earlier.

You are then invited by the NRMA to support their campaign to get more of the petrol taxes spent on upgrading our roads. Your reaction was probably a knowing grin and a nod, as you surveyed the sea of immobile traffic around you.

In a flight of fancy, you imagine yourself at home, seated squarely in front of the PC, modem at the ready, fax machine and videophone on standby. As an information worker, you are about to sign on for the day by logging into the office computer. Your electronic diary has the day planned, and the network connects you to whoever and whatever you need.

When you've read the e-mail, you will tackle the voicemail from the overseas offices. After coffee in the sunroom, when you've got what you need from the teletext, you can interactively update the budgets with your interstate colleagues. Perhaps you will take a swim after lunch on the back verandah. If only you could . . .

Instead, you move up another half a car length, prompted by the horn blast behind, beckoned on by that need to conform to habit.

If only you had a car phone to call the office to postpone that meeting you have already missed. You make a mental note of resolve to support the road campaign, and shift into neutral.

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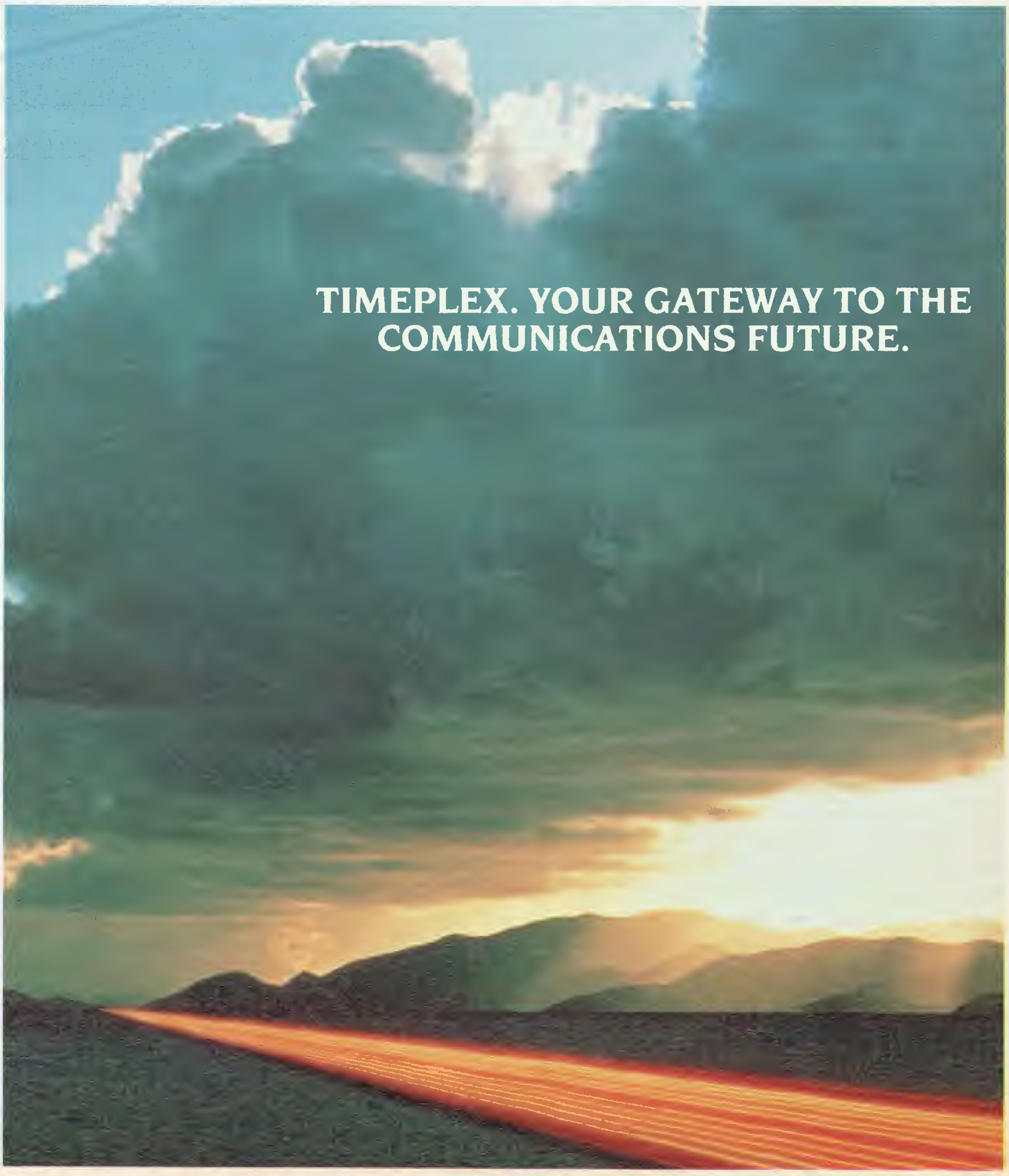


DATA COMMUNICATIONS

PRODUCTS, SERVICES, STANDARDS, NETWORK MANAGEMENT

Coping with the distribution of data according to the book of standards

For all the publicity PCs and PC Lans are receiving, connecting terminals to host computers, both mainframe and minicomputers, remains an issue for many organisations. In this second part of a three-part series, Stephen Coates examines use of the standards for data distribution.

THE problem of connecting terminals to computers is almost as old as digital computers themselves. Even when the computer was a room full of vacuum tubes and the terminal was a single teleprinter in front of it, they had to be connected.

The years that followed the introduction of commercial computers saw the rise and fall of the punched card before the use of terminals on a wide scale made their connectivity a major issue. By this time, terminals were no longer just teleprinters, in fact teleprinters are now not often used for anything other than mainframe consoles. Printers became quieter and were moved from the computer room and CRTs became omnipresent only to be renamed VDUs and more recently to be given the more nebulous title of workstations.

This decade has seen a whole slather of new computing and local area communications technologies. PCs have been transformed from toys to major business tools; Lans have been designed specifically for them; data PABXs and a plethora of other products have been introduced by third party equipment suppliers and the telecommunications suppliers have kindly offered the services of their PABXs for data distribution.

And if this was not enough, the ISDN is claimed to be the solution to all of our communications problems, both local area and wide area.

While all of this has been happening, users have had to find ways of connecting their existing terminals to their existing computers and while many of the above-mentioned technologies have had their origins elsewhere, computer suppliers have concentrated on two basic methodologies — dedicated point-to-point cabling and local area networks.

In the early days of commercial computing, suppliers produced their terminals and had their own terminal to host interfaces. These interfaces did not adhere to such things as ISO and CCITT standards because their standards for data communications did not exist.

But the invention of the modem changed things. At a time when telecommunications networks around the world called all the shots and deregulation existed only in dictionaries, these networks collectively required the computer vendors to adopt and adhere to their standard, rather than attempting to support all of those used by the suppliers.

Thus, in 1962, RS232A was born. RS232 defines an interface between a data terminal equipment (DTE) and a data circuit terminating equipment (DCE). Because DCEs were, and often still are, modems, the specification included control signals to alternatively pass data in both directions over a half-duplex link, a complete secondary channel and DCE supplied clocking for synchronous transmission.

RS232 is a complete standard as it includes physical (plug shape), electrical (voltage, impedence) and functional (specific circuits) specifications.

The impact of this standard has been very far reaching. It is symmetric. Terminals and computers are both DTEs, and it is the DCEs (the telecommunications circuit) that controls the interfaces.

It also provided no end-to-end signalling — that was to be done by the protocols used by the computer. In those early days, they did.

Two years after the introduction of RS232, the Consultative Committee of International Telephony and Telegraphy (CCITT) released an almost identical set of standards. V.28 defined the electrical characteristics, V.24 defined the circuits and the ISO 2110 standard for the ubiquitous DB25 plug was referenced.

While RS232 and V.24/V.28 were designed only for DTE to DCE interfaces, computer suppliers, particularly those building the minicomputers that swept the market during the 1970s and early 1980s, quickly adopted them for local host to terminal communications. As both host and terminal interfaces were DTEs, crossover cables were used to provide the necessary adaptation. Despite its shortcomings, this interface is so much more popular than all of the others, many of which were designed to replace it, that it is difficult to buy communications equipment that cannot be equipped with it.

Nevertheless, RS232 defines only an interface, not a communications system, and it was a communications system that the market needed.

In 1974, following research by the American Department of Defence Advance Research Projects Agency (Arpa), Xerox, DEC and Intel collectively released Ethernet. During the same decade, Cambridge University in the UK produced the Cambridge Ring, a token passing ring, and other local area networks were developed, many using broadband technology developed from North American CATV systems.

The idea of the Lan was simple. Have a single high speed high capacity cable snaking around the building, connect all of the terminals to it and plug it into the host computer or computers. All of the terminals would then be able to access these computers without all of the shortcomings of a mass of dedicated cables and individual host interfaces.

Lans continued to evolve during the 1980s. Xerox released Ethernet II and the standard was put forward to the Institute for Electronics and Electrical Engineers (IEEE) for ratification, emerging as two separate standards — IEEE 802.2 and 802.3, in 1985. A token bus Lan was standardised as 802.4, and in 1975, IBM released the token ring, which the CCITT later standardised as IEEE 802.5.

Not to be left out of the action, the International Standards Organisation (ISO), famous for the seven layer model, and of which the IEEE is a part, issued the same standards with its own numbers as IS 8802.2, 8802.3, 8802.4 and 8802.5.

Being designated as international standards opened the floodgates. Many suppliers quickly announced support for, and eventually released products conforming to, these standards. A few other suppliers who had extensively developed their own proprietry Lans stayed with them. (see 'Proprietary Lans').

All of this leads us to where we are today. All of the major computer suppliers support one Lan, and many support more. They also offer a number of interfaces to connect to local terminals and third party supplied equipment such as multiplexers, data PABXs and modems.

For all the years that Lans have been stealing the limelight, the overwhelming majority of terminals were cabled directly to the host computers — using RS232 interfaces. RS232C, the current version of the standard, suffers from two primary restrictions — bit rate and length of cable. A maximum of 20,000 bits per second is explicitly stated in the standard, and although this is often stretched (see table 2), it can be stretched only so far.

Distance is another matter.

The standard itself makes no mention of the maximum cable length, but IBM reportedly conducted a number of tests based on the electrical specifications of the standard in the early 1960s and announced that it could not guarantee transmission with a cable length greater than 15 metres.

Although few suppliers will guarantee its use at longer distances, because their implementations often deviate from the electrical specifications (and usually the functional specifications as well) most will unofficially acknowledge its operability at much greater distances.

[The author has worked with asynchronous transmission at 1200 bit/sec over distances over 300 metres, and synchronous transmission at 9600 bit/sec over 177 metres, without error.]

Nevertheless, these restrictions led to the introduction of new standards. RS422 (CCITT V.11 and X.27) defines the electrical characteristics of a balanced circuit and RS423 (V.10 and X.26) similarly defines an unbalanced circuit between a DTE and a DCE.

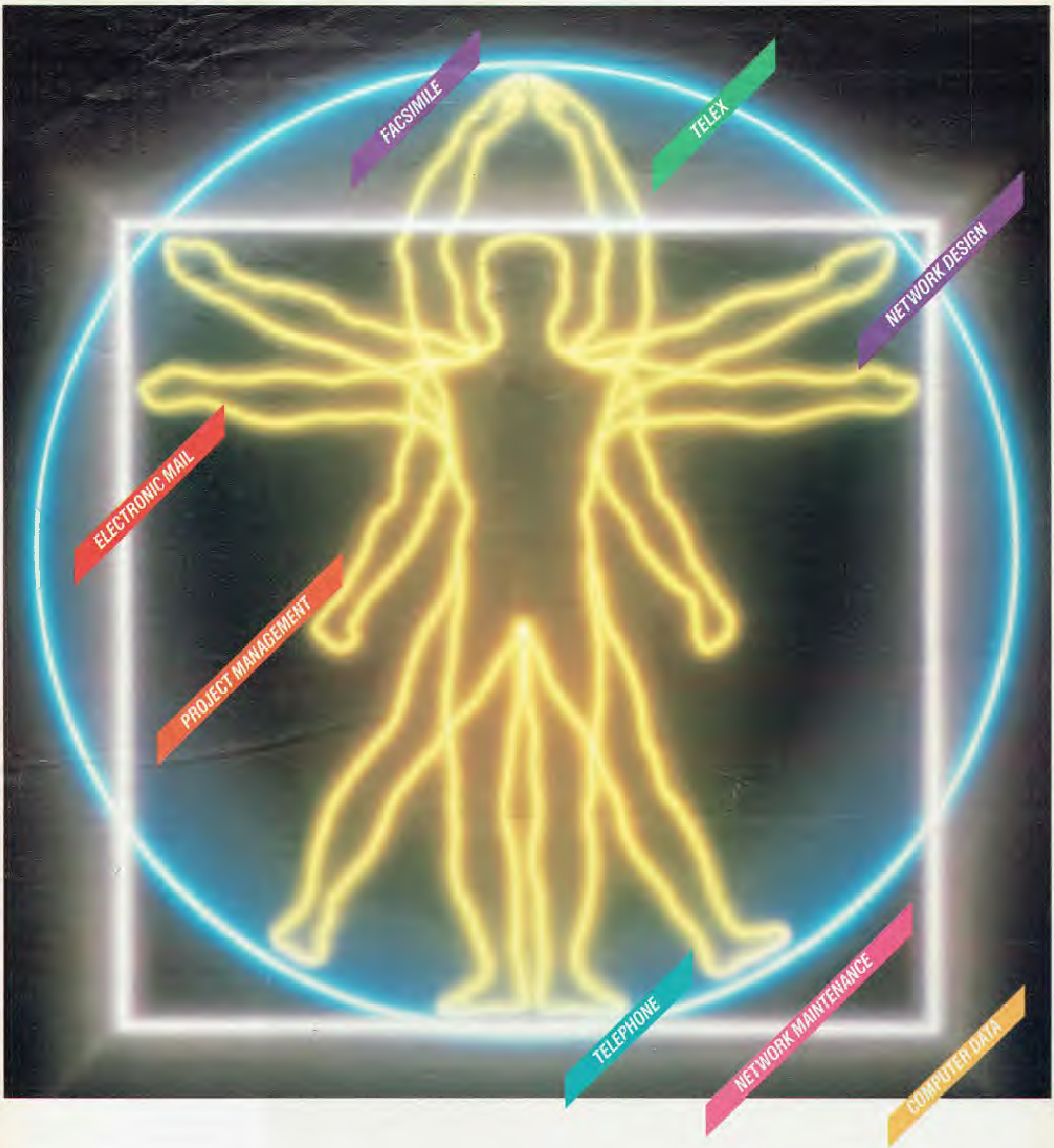
(Continued page 10)

Table 2: Local interface specifications

Supplier	V.24/V.28 (RS232C)			Other interfaces		
	sync/async	maximum bit rate (K-bit/sec)	maximum cable length (metres)	interface	maximum bit rate (K-bit/sec)	maximum cable length (metres)
Amdahl		19.2		V.35	256	
CDC	async	38.4	60	async RS422/ RS449	64	58
	sync	56.0	60	sync RS422/ RS449	128	58
Data General	async	19.2	15	RS422/prop.	9.6	910
Datapoint	async	19.2	300	RS422/RS449	256	50
	sync	64.0	15	X.21	19.2	15
DEC		20				
Fujitsu A series	async	9.6	20	RS422/RS449	38.4	500
Fujitsu M series		19.2	30			
HP 1000	async/sync	38.4/56.0		RS422/prop.	19.2	
HP 3000	async/sync	19.2/56.0				
HP 9000	async	19.2		RS422/prop.	19.2	
	sync	56.0		RS423/prop.	19.2	
		19.2		RS422/prop.	48.0	
IBM						
ICL		20				
Nixdorf		19.2	15	RS422/RS449	19.2	500
				IHSS	64.0	2000
Prime		19.2				
Tandem		19.2	15	RS422/RS449		
Unisys A series		64.0	15			
Unisys B series		64.0	15			
Unisys 1100 series		64.0	15			
Unisys U series		38.4	15			
Wang VS series	async	19.2	600 (VDUs) 15 (printers)	928	4270	600 (co-axial cable), 240 (twisted pair)

Table 1: Interfaces to local terminals

Supplier	async V.24	sync V.24	RS422 + RS449	RS422 + proprietary	RS423 + RS449	RS423 + proprietary	X.20	X.21	Others
Amdahl	X	X						X	V.35
CDC	X	X							URI
Data General	X			X					
Datapoint	X	X	X						
DEC	X	X				X			
Fujitsu A series	X		X					X	
Fujitsu M series	X	X							
HP	X	X							
	X	X		X			X	X	current loop
IBM	X	X	X	X					
ICL	X	X	X						
Nixdorf 8860		X							IHSS, SAS
Nixdorf Targon	X		X						IHSS
Prime	X	X							current loop, V.35
Tandem	X	X	X					X	current loop
Unisys A series	X	X			X			X	
Unisys B series	X	X		X	X			X	
Unisys 1100 series	X	X			X			X	
Unisys U series	X	X			X			X	
Wang — VS series	X								928



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Coping with the distribution of data according to the book of standards

(Continued from page 8)

Both trade-off maximum bit rate and cable length. RS422 permits transmission of 100K-bit/sec over 1200 metres, and 1M-bit/sec at up to 150 metres.

But both only define the electrical characteristics of a circuit and make no mention of functional circuits or shape of the plug. This is where RS449 comes in.

RS449 defines the physical and functional characteristics of a DTE to DCE circuit. It is elaborate. It uses a 37 pin plug, of which 36 pins are defined. And if that was not enough, a nine pin plug is specified for the secondary (backward) channel!

This is where it all comes unstuck. Not only are these plugs bulky, but with the advances in microprocessing technology and digital transmission systems, many of the circuits defined by RS449 are either unnecessary or their functions are able to be performed in software by the protocols. Furthermore, as interface circuits use potentials higher than the five volts of semiconductor logic, they are expensive.

As table 1 shows, few computer suppliers have implemented RS422 + RS449 and fewer have bothered with RS423 + RS449 for host to terminal interfaces. A few offer proprietary interfaces that purport to adhere to the RS422 or RS423 electrical characteristics, but as they often simply call these interfaces RS422 or RS423, this can cause all sorts of problems when one is trying to connect such interfaces to so-called RS422 and RS423 interfaces of other equipment.

The V.35 interface is also a DTE to DCE interface. It operates at up to 56K-bit/sec, but as it offers no cable length advantage over RS232, few suppliers use it to interface to their terminals.

In 1972, the CCITT ratified two new interface standards of its own. Designed for public data networks (as all X. series standards are), X.20 and X.21 define DTE to DCE interfaces. X.20 references the X.26 (RS423) electrical characteristics and X.21 references X.27 (RS422) thus achieving the much greater distances and bit rates these standards permit. Both use the DB15 plugs, using four and seven circuits, respectively. The difference between the two is that X.20 is used for start-stop (asynchronous) transmission and X.21 for synchronous.

Despite their obvious advantages, these two interfaces are all but unsupported by the major computer suppliers. It would appear to be another case of American-controller computer companies ignoring developments that originated in Europe.

In addition to these standard interfaces, there are, of course, proprietary interfaces. Many of these have associated proprietary protocols together with which multi-port cluster controllers, cascaded terminals and/or long cable lengths can be supported.

Such approaches, while offering many benefits, are not easily adapted to a multi-vendor or even a mono-vendor multi-host environment.

Consequently, like Cobol, RS232 continues to be with us long after more advanced featured and technologically appropriate alternatives have been devised, tested, documented, standardised and implemented.

The computer suppliers, however, are occupied with local-area networks and are unlikely to make major changes in the area of such "unmultiplexed" physical interfaces.

At about the same time that Ethernet made its first public appearance, the International Standards Organisation (ISO) first released its now-famous seven layer model for open systems interconnection (OSI). The model was primarily concerned with providing a conceptual architecture into which standards for point-to-point, multi-point and networked communications could be written.

The IEEE 802 series standards for local-area networks were written to address technological methodologies rather than to exactly correspond to specific OSI layers, the result being that there is considerable disagreement as to which of the bottom two layers they belong.

As table 3 illustrates, Ethernet/802.3 is by far the most supported Lan for terminal to host connectivity. Of course, a number of specialist suppliers offer non-host specific Lans that interface to the computers concerned, but this study is focused on the directions of the computer suppliers themselves.

This table also lists the suppliers' recommendations for a Lan to attach terminals and PCs to their host computers. For all its publicity, IEEE 802.5 (token ring) is regarded by most suppliers as a PC Lan, although IBM also uses it to link 3174 cluster controllers to its front-end processors.

Nevertheless, as table 4 illustrates, although most suppliers support Ethernet/802.3, there are a number of variations to their implementations. Ethernet generally refers to Ethernet II which is only slightly different from, and compatible with, Ethernet I. IEEE 802.3 is different from, and not compatible with, either Ethernet I or II.

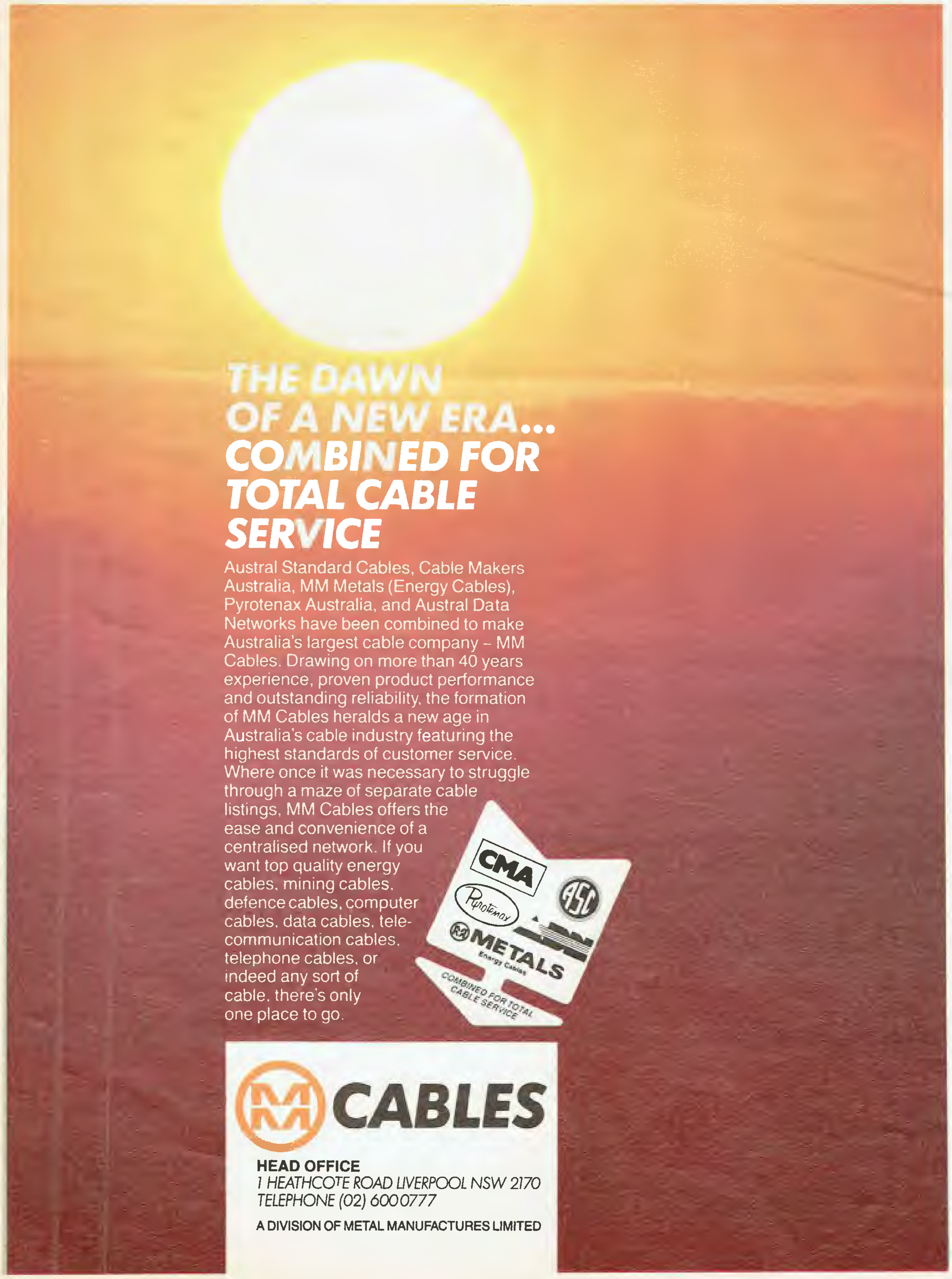
Most suppliers use the terms IEEE 802.2/802.3 and Ethernet interchangeably, but as table 4 illustrates, many support both standards, and some support only one. Both Ethernet II and IEEE 802.3 define the media access control function to be the CSMA/CD methodology, and both use the 802.2 standard for logical link control.

If that was not enough, there is both standard (thick wire) Ethernet (10Base5) and thin wire Ethernet (10Base2) co-axial cable which differ only in the cable diameter and the permitted maximum length of cable segments, and an implementation of Ethernet using twisted pair cable (10BaseT).

The 10BaseT standard for unshielded dual twisted pair Ethernet, also called Starlan, was a joint development of Hewlett Packard and Synoptics. As it uses this cable for dedicated point-to-point connections between transceivers and multiport repeaters that connect to a co-axial backbone, twisted pair Ethernet is much more than an alternative cable media, it is an alternative topology.

Despite its many implementations, users are unlikely to encounter many problems so caused unless equipment from different vendors is used. In such cases, users will have to ascertain exactly to what stan-

(Continued page 11)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DATA COMMUNICATIONS

Coping with the distribution of data according to the book of standards

(Continued from page 10)

dards the equipment adheres.

Some components such as transceivers and multiport repeaters need only be compatible with the standards for layers 1 and 2. Terminal servers and gateways must also be compatible with standards used on the higher layers.

The research at Arpa that led to the original development of Ethernet also produced protocols for layers three and four: Internet Protocol (IP), a connectionless protocol for the network layer; and Transport Control Protocol (TCP), a connection-oriented protocol for the transport layer.

Xerox produced an alternative protocol — Xerox Networking Standard (XNS).

Both were supported by a number of suppliers, particularly independent Lan specialist vendors. TCP/IP was considered to be superior for terminal to host traffic whereas XNS was more efficient for interprocessor communication.

Enter the ISO. Its standards IS 8473 and IS 8073 are almost identical to IP and TCP, respectively. The other ISO protocols that appear in table 4 are, like IS 8473, network protocols. IS 8208 is a packet layer protocol, equivalent to layer 3 of X.25, and IS 9542 is a routing exchange protocol.

The ISO has also standardised a number of protocols for the top three OSI layers for such applications as file transfer and electronic mail, but these are not relevant to terminal to host connectivity.

There is an observable migration towards these OSI standards. CDC, the only computer vendor supporting XNS, plans to phase-out the use of this protocol. No supplier has announced similar plans for TCP/IP, but in a few years it is likely that most of the non-proprietary terminal to host local area networks will use IEEE 802.2/802.3 and OSI higher layer standards.

But if Lans have so much going for them, why isn't everyone using them? Compared to dedicated terminal to host cabling, Lans have advantages and disadvantages.

All communication to the host from terminals connected through a Lan takes place through a single host interface. Not only does this simplify the addition of terminals to the network, it provides a contention facility. If more than one host computer is used and they use identical Lan standards, the Lan can provide terminal users with a means of accessing more than one host.

Lans can provide communication over much greater distances than dedicated cabling. IEEE 802.3 can extend up to 1500 metres using two repeaters, and up to 2500 metres by adding a 1 km fibre optic link.

It is not necessary to use a Lan to provide communication over such an extended local area — single port and multi-port line drivers and short-haul modems will provide similar cable lengths for RS232 terminal to host connections — but only a Lan inherently provides these distances.

The Lan is a system, and systems can fail. Key Lan components, not the least of which is the cable, can shut down the entire system if they fail. Systems can also be managed, and a Lan provides the user with management facilities not possible with dedicated cabling.

The primary advantage of dedicated cabling is that by using the ubiquitous RS232 interface for all host computer and terminal interfaces, equipment such as modems, multiplexers, and PABXs can be included as part of the communication system simply by plugging them in. Lans need expensive gateways to do this.

Lans thus do have several advantages over dedicated cabling, so why doesn't everybody have one?

Many systems were installed long before Lans achieved the popularity and features they enjoy, and it is simple and cheap to gradually enlarge an existing dedicated cabling environment, compared with the alternative of replacing it with a Lan.

(Continued page 12)

Table 3: Lans supported and recommended

Supplier	Lan interfaces supported					Lan recommended for host connections to:	
	Ethernet	802.2/802.3	802.2/802.4	802.2/802.5	Others	Terminals	PCs
Amdahl				future		Ethernet or token ring	
CDC	X	X				802.2/802.3	
Datapoint					Arcnet	Arcnet	
DEC	X	X				802.2/802.3 via terminal servers	802.2/802.3 directly connected
HP 1000	X	X	future			802.2/802.3 via terminal servers	802.2/802.3 directly connected
HP 3000		X	future				
HP 9000	X	X	future				
	X	X	X	X		not stated	
IBM	X	X	X	X		Lan not recommend	Token ring
ICL	X	X				802.2/802.3	802.2/802.3
Nixdorf — Targon	X	X	planned	planned		proprietary cabling	Ethernet
Prime	X	X			Ringnet	Ethernet or 802.2/802.3	
Data General	X	X				Ethernet	
Fujitsu — A series	X	X				Ethernet	
Fujitsu — B series	Unix O/S only	Unix O/S only				802.2/802.3	
Unisys — A series	X	X	X	X		not stated	
Unisys — B series	X	X	X	X		not stated	
Unisys — 1100 series	X	X	X	X		not stated	
Unisys — U series	X	X	X	X		not stated	
Wang — VS series		X			Wangnet	802.2/802.3	

Table 4: Standards used on the bottom 4 layers of the OSI 7-layer model for Local Area Networks.

Supplier	Media	Layers 1 and 2	Layer 3	Layer 4
CDC CDCNET	10 Base 5 10 Base 2	IEEE 802.2/802.3 Ethernet II	IS 8473 IS 8208 (1989)	IS 8073 (class 4, class 0 in 1989)
	10 Base 5 10 Base 2	IEEE 802.2/802.3 Ethernet II	IP X.25	TCP EGP
	10 Base 5 10 Base 2	IEEE 802.2/802.3 Ethernet II	XNS Internet	
DEC Vax	10 Base 5 10 Base 2 10 Base T	Ethernet II	LAT (local area transport)	
	10 Base 5 10 Base 2 10 Base T	IEEE 802.2/802.3 Ethernet II	IS 8473 IS 9542 X.25	IS 8073 (classes 0,2,4)
DG	10 Base 5 10 Base 2 1 Base 5	IEEE 802.2/802.3	IP	TCP (class 4)
Fujitsu A series	10 Base 5 10 Base 2	Ethernet II	IS 8473 IS 8348/DAD1	IS 8073/DAD2 (class 4)
Fujitsu M series	10 Base 5 10 Base 2	IEEE 802.2/802.3 Ethernet II	IS 8473 IS 8348/DAD1	IS 8073/DAD2 (class 4)
HP 1000	10 Base 5 10 Base 2	IEEE 802.2/802.3 Ethernet II	IP	TCP
HP 3000	10 Base 5 10 Base 2 10 Base T	IEEE 802.2/802.3	IP	TCP
HP 9000	10 Base 5 10 Base 2 10 Base T	IEEE 802.2/802.3 Ethernet II	IP	TCP UDP
DPS6 plus	10 Base 5 10 Base 2 10 Base T	IEEE 802.2/802.3 Ethernet II	IP IS 8473 X.25	TCP IS 8073 (class 4)
IBM (all SAA computers)	10 Base 5	IEEE 802.2/802.3	IP	TCP
	IBM cabling types 1-5	IEEE 802.2/802.5		
ICL	10 Base 5	IEEE 802.2/802.3	IS 8473	IS 8073 (class 4)
Nixdorf Targon	10 Base 5	IEEE 802.2/802.3	IS 8473	IS 8073 (classes 0,2,4)
Prime	10 Base 5 10 Base 2	IEEE 802.2/802.3	Primenet	
	10 Base 5 10 Base 2	Ethernet II	IP	TCP UDP
Wang VS series	10 Base 5	IEEE 802.2/802.3	IP	TCP (classes 0-4)
Unisys A series B series 1100 series	10 Base 5 10 Base 2	IEEE 802.2/802.3	IP (IS 8473 coming)	TCP (IS 8073 coming)
Unisys 5000 series	10 Base 5 10 Base 2	IEEE 802.2/802.3	IP (IS 8473 coming)	TCP (IS 8073 coming)
		IEEE 802.2/802.4 IEEE 802.2/802.5	(IS 8473 coming)	(IS 8073 coming)
Unisys 7000 series	10 Base 5 10 Base 2	IEEE 802.2/802.3	IP (IS 8473 coming)	TCP (IS 8073 coming)
		IEEE 802.2/802.4	(IS 8473 coming)	(IS 8073 coming)

Table 5: Costs of interface configurations

Supplier	Cost of configuration		
	1	2	3
CDC	$5200	$3500	$5200
DG	$28,000	$9400	$16,200
DEC	$22,300	$6600	$9900
HP	$20,300	$34,800	$34,800
Bull	$20,200	$14,100	$23,300
ICL	$46,500	$5800	$8700
Nixdorf	—	$3000	$5000
Unisys	$30,300	$32,000	$48,000

Notes on configurations:

1. Configuration 1 assumes that the host computer with a Lan interface already exists. The Lan backbone cable already snakes throughout the building. It is the cost to connect 24 asynchronous terminals to this Lan in three groups of eight at three separate locations within the building and configure the host (if necessary) so that up to 16 sessions from these terminals can take place simultaneously.
2. The other configurations assume the existance of a host computer with vacant slots for interface cards to be inserted. Configuration 2 is the cost of 16 asynchronous interfaces and configuration 3 the cost of 24.
3. Readers are cautioned against making any direct comparisons between the costs supplied by the various suppliers. While Unisys's prices for the latter two configurations are high, each of their interfaces is capable of supporting nine terminals using a poll and selected protocol. HP's prices are for its standard RS232 interfaces. HP also offers a lower-cost 3-wire pseudo RS232 interface which it usually uses for locally-connected terminals.
4. The average cost of connecting a terminal to an existing Lan is thus $1030. The average cost of 24 asynchronous RS232 interfaces is $18,900 and the average cost of 16 is $13,660. These figures will be used for a broad comparison of methodologies for connecting local terminals to host computers that will appear with the concluding article of this series.

Coping with data distribution

(Continued from page 11)

The bottom line, as always, is cost.

Table 5 lists the costs of two configurations that a number of suppliers have provided. Although the cost of interfacing to a host computer from a terminal is less expensive using a Lan than by dedicated cabling, a Lan has a high capital cost associated with it.

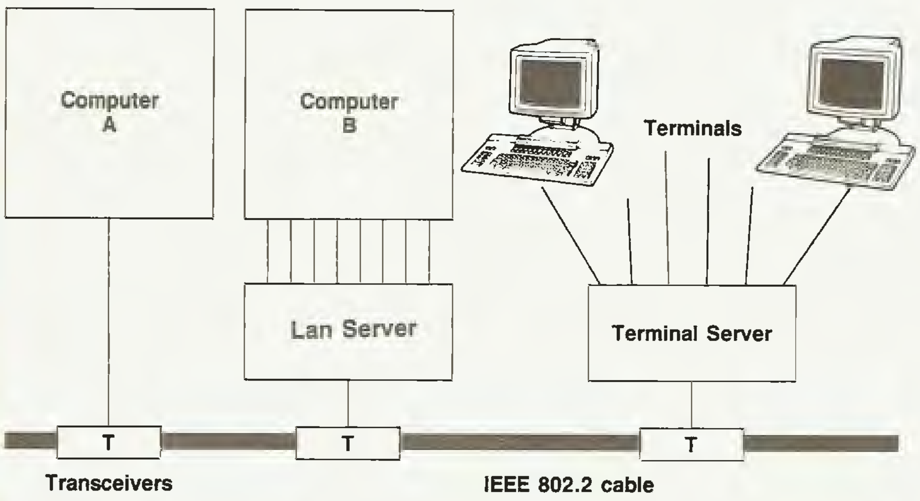
For many sites, particularly the smaller sites, the distance limitations of dedicated cabling are not an issue but the capital cost of a Lan is.

In the years to come, Lan standards will crystallise and be more widely and uniformly supported than they are today. Lans will do battle with data PABXs, PABXs with integral data switching and the ISDN.

But in offices big and small, terminals will often connect to the host computer with RS232, X.21 and other interfaces, using dedicated cabling.

Notes on supplier comparisons
In addition to the suppliers listed in the table, National Advanced Systems responded, but they do not sell their own FEP. Concurrent and NCR declined to respond.

Diagram 1: LAN support from host computers



For the purposes of this article computer A supports the IEEE 802.3 Lan illustrated, whereas computer B does not, even if its supplier also sells all of the equipment illustrated.

Proprietary Lans

OF THE many localarea network technologies that computer suppliers have developed and introduced into the market during the past two decades, a few have disappeared, others have been relegated to use with only specialised applications, and some have been standardised by the IEEE, achieving widespread support. But three proprietry Lan systems continue to be supported and used by their respective suppliers.

ARCNET: At the same time as DEC, Intel and Xerox were working on Ethernet, Arcnet was being developed by Datapoint, and it was first released in 1977. Using a token-passing contention methodology similar to the 802.4 token-passing bus, Arcnet uses a star topology to join CPUs together with multiport repeaters called active hubs.

Arcnet was originally developed to link the various components of Datapoint's networked microcomputers, but asynchronous terminal support and gateways to IEEE standard Lans have recently been introduced.

Although not itself an international standard, Datapoint has been exploring the issue of standardisation with the IEEE for the past 18 months. Arcnet licences can be obtained from Datapoint, and at present, about 25 other suppliers have procured them.

"Datapoint fundamentally stands by Arcnet," said Datapoint's marketing manager Shirley Forster, who said that the token-passing methodology is most efficient, and that Arcnet, which operates at 2.5 M-bit/sec, might be made faster.

RINGNET: Ringnet is a proprietary Lan first offered by Prime in 1979. It is a proprietary implementation of the Faber-Newhall version of the Cambridge Ring token-passing ring technology first developed at Cambridge University in the UK and subsequently at MIT in the US, with which Prime has had a long association.

Ringnet uses proprietary protocols on all OSI layers, although a variation of X.25 is used on layer three. As with Arcnet, Ringnet is used only to link Prime CPUs and gateways together, which it does at a speed of 10 M-bit/sec using twin co-axial cable.

Prime has neither proposed Ringnet to the IEEE as a standard, nor has it yet licensed Ringnet to other vendors, and Prime supports both 802.3 and Ethernet for terminal to host communications.

Nevertheless, according to Prime marketing manager Peter Billingham, Ringnet will continue to be available and supported for many years to come.

WANGNET: Wangnet, like Datapoint's Arcnet, was an internal development, based upon North American broadband CATV technology.

Wangnet uses dual co-axial cable and broadband headend with the frequencies allocated to a number of channels. While some channels are used for interprocessor communications, other can support the 802.3, 802.4 and 802.5 IEEE protocols for terminal to host communication.

While such an architecture would itself not be established easily as a multi-vendor international standard, Wang has had considerable input to IEEE's preparation of the 802.7 standard for broadband frequency management.

Wangnet will remain available for the foreseeable future.

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RE8B

INDUSTRY

VENDOR STRATEGIES, MARKET TRENDS, BUSINESS NEWS

Infolink's Asian partnership is no cause for surprise

By Noel Bennett

SYDNEY — Considering Infolink Group Ltd's present shareholding, the recently announced additional shareholders from South-East Asia should cause no surprise.

No surprise, either, should be generated by its intention to build upon its acquisition of an Australian Value Added Services (Vas) supplier to develop new business in this region.

However, while the comparatively young Infolink Group is casting its corporate eyes towards the Pacific Basin, it is not neglecting the “traditional” markets of North America and Europe.

The group, headed up by chief executive, Anthony Gould, has expanded quickly by acquisition and now has the following operating services and products subsidiaries:

- Infolink Computer Services Pty Ltd, and Infolink Network Pty Ltd formed by the acquisition of Mayne Nickless Ltd's commercial computing subsidiary, Mayne Nickless Computer Services, for a reported $A4 million;
- Infolink Software Pty Ltd, supplier and developer of KeyPlus, a Vtam-based online data entry system;
- Portable Data Technology, hand-held data terminals, including models which can transmit data via radio frequency to a data collection computer;
- AG Systems (Australia), securities management system;
- Search Tech, a joint venture between Infolink and the NSW Government Printer and NSW Investment Corp which has developed the technology to store all forms of data, including pictorial and graphics, on laser disk for subsequent fast retrieval; and
- In Touch Tutorials, involved in audio and video training products and the only member of the group not concerned with data storage and retrieval.

Overseas, Infolink Group International Ltd looks after the group's activities and interests in the US and Britain and Infolink Asia Ltd in South-East Asia.

The new shareholders in the Infolink Group, each with a 5 per cent share, are:

- The Hong Kong Chinese Bank Ltd, in turn owned by the Liem and Lippo Groups of Indonesia. The bank itself is managed by Mochtar Riady, said to be Indonesia's foremost private banker, and who is also the chief executive director of Bank Central Asia, described as the largest private bank in Indonesia; and
- Robina International Holdings, part-owned by the Bangkok Bank Ltd. Associated companies of this bank, “reputedly” the largest private bank in Asia, will be working with Infolink in Thailand. The bank itself operates 13 computer centres and the country's principal data network.

These new investors join some other “Oriental” shareholders. The established shareholders are: Asia Securities International; NSW Investment Corp, Techwa Pty Ltd (joint venture partner of the Japanese Daiwa Securties Group), Asian Oceanic Group, interests associated with AIA Capital Corp Ltd and Hamerwood Holdings, Gould's personal company.

The group intends to list later this year, Gould said. On the new shareholdings, Gould said the six companies within the group had developed products and services which could be successfully marketed in Asia.

“We recognised that we could not simply open an office in these countries and be ‘killed’ by people wanting to do business with us,” he said.

“A survey of those markets (Thailand and Indonesia) as to the demand for our services showed that they will do business with people they know and trust and who are committed to long-term partnership.

“That's why we chose the Hong Kong Chinese Bank Ltd and Robina International Holdings and we are developing a true fifty-fifty joint venture relationship with them.”

As to specifics in these countries, and indirectly stressing the key role which Infolink Network's expertise would play in corporate expansion, Gould said Bank Central Asia in Indonesia had a very significant network capability, but it was only being used at present for internal use and not for other Vas such as EFT/POS. The telecommunications needs of that country would seem daunting — 190 million people spread over some 1000 islands.

A similar situation prevailed in Thailand, Gould said, and both countries also realised that software used on mainframes had to be designed virtually from scratch or existing products heavily modified to suit each of their particular needs. Infolink was able to help them in this task.

Further, besides building stronger internal networks, both countries were looking outwards and required interfaces with international telecommunication systems.

Outlining the next step in South-East Asia, Gould said that after Thailand and Indonesia, Infolink would be concentrating on the Hong Kong market. On the communications side of Infolink's business, talks had been held with Cable and Wireless, among others, but no final decision had been made as to who its Hong Kong partner would be.

Before Infolink acquired the computer services arm of Mayne Nickless, the division had racked up $A16.25 million in revenues during the 1987-88 financial year. Gould now expected that this Vas networking and mainframe processing enterprise and associated skills will contribute at least 50 per cent of Infolink's estimated turnover of between $A30 to $A35 million in the 1988-89 year.

Describing the acquisition as a “major strategic investment,” Gould noted that increasingly, processing of many applications was moving away from mainframes over to networked personal computers and minicomputers.

Accordingly, transmission of data from one location to another, “distributed intelligence”, would inevitably increase and would be accompanied by a corresponding need for Vas with the highest demand for network security and integrity.

Infolink Network saw its position as providing the basic media, based on Tymnet-supplied products, and using that media to supply a whole range of Vas.

However, this Vas sector of the market is becoming increasingly competitive in Australia with, for example, Csironet, now owned by Paxus Corp, winning the contract to provide the EDI network/software facilities for the National Trade Services Network. Telecom and OTC are also vigorously contending this market.

Gould said he believed Infolink Network was more commercially oriented than Telecom, being more sympathetic to the requirements of the market place and able to provide tailor-made, high-quality value-added services.

He saw Infolink Network's activities as being complimentary to Telecom, adding more traffic to its lines, and that the carrier's strength was in providing bulk services to the public at large. Indeed, Infolink wanted to work closely with all carriers as “our and their interests are synonomous.”

Further, user response would be “fragmented” if all parties were going to constantly compete with one another. In areas of new technology such as VAS, acceptance by a critical mass of customers was essential. Accordingly, in order to reach that position quickly, it was necessary that each party involved should contribute that service which they did best and that these elements be combined into one effective package.

On Europe, Gould said that while this market was very important for the group as a whole, he was not sure that Infolink Network could operate there in the same manner as it did in Australia. However, this subsidiary could take a leading role in information services and build upon its data management tools expertise. He noted that in Europe, the Infolink Group had to be well-established with a defined infrastructure in place before the deregulation of the markets there, slated to operate in 1992.

Dowty group buys all of Case Australia

SYDNEY — Seeing that Case Communications Systems' managing director, Barry Foster, believes that the future communications market will be in integrating Lans and Wans, the tie-up with the Dowty Group could not come at a better time.

Dowty has now acquired full ownership of Case Australia. Last year, Dowty acquired Case Communications of the UK and so acquired a 32 per cent in Case Australia. Dowty has now bought the remaining 68 per cent of the equity.

On the same day, Case Australia announced the release of the Series 6000, an Ethernet-based Lan which incorporates OSI standards.

Foster did not envisage any problems with assumption of full ownership, saying it would be “business as usual” and that Dowty allowed subsidiaries to be independent — the new owner had a small corporate headquarters.

Further, Case Australia would be better placed in the market place, particularly in time-division multiplexing and Lans.

Dowty, a substantial , UK-based international engineering and electronics enterprise, is a leading supplier of modems in Europe and in 1987 acquired Datatel, a US-based TI multiplexer supplier.

Case UK's strengths were in networking multiplexers, packet switching, message handling and more recently, Lans. Accordingly, when Case UK was seeking a friendly partner in 1988, the “synergy between the two groups was evident.” with Dowty's expertise being in modems and digital systems.

Before the acquisition of Case Australia, Dowty's interests in communications were:

- Case Communications, UK: representing all networking products worldwide outside the Americas.
- Case/Datatel, US: Looking after the Americas market.
- Dowty Information Systems, UK: representing modems and simple multiplexers to distributor markets.
- Mayze Systems, UK: Advanced development company representing ISDN and next generation networking products.

Besides the US, Case has been operating in France, Hong Kong, Singapore and now Australia and New Zealand.

Agents to use laptops

SYDNEY — Colonial Mutual is working with OTC to provide additional message processing benefits for field agents using Compaq laptop computers.

Under the proposal, OTC is to provide switching facilities for the laptops, connected via Austpac to Colonial Mutual's head office.

Besides conventional electronic mail messages, agents will be able to store raw information received from head office and then tailor proposals to meet a client's specific needs.

OTC strengthens its relationships with high tech companies while expanding

By Noel Bennett

SYDNEY — OTC is maintaining its push into relationships with high-tech companies as well as pursuing business opportunities in the South Pacific.

The international marketing arm, OTCI, has acquired a 7.5 per cent interest in Queensland company, Mitec Ltd, a microwave sub-systems development company.

Executive director of OTCI, Peter Shore, said the carrier was particularly interested in Mitec as “it saw a synergy between its product capabilities and our activities in the South Pacific and Asia.

Mitec's most notable achievements so far are said to be the development of a low-cost microwave transmitter-receiver which can fit in the palm of the hand and an antenna which has allowed “live” television transmission from Grand Prix racing cars and the America's Cup yachts.

Besides OTC. Mitec's clients include Telecom, Aussat, AAP-Reuter, LM Ericsson, Department of Defence, Thompson-GSF (France), Hughes Aircraft Company and British Aerospace.

Also down the technology track, OTC has signed an agreement with Codan Pty Ltd, South Australia, for the provision of a Demand Assigned Multiple Access (Dama) system which will be at the heart of the new South Pacific telecommunications network.

The Dama technique of handling calls maximises the use of the space segment and is said to be ideally suited for telecommunications applications generating low traffic volumes.

The system is also said to be one of the most advanced in the world, allowing a mix of earth stations with antenna sizes from 4.5m up to 32m to interconnect with each other efficiently, regardless of their location in the South Pacific.

Codan is presently producing Intelsat Business Services (IBS) modems for OTC, acting as the project managers in the development of a 4.5m Ku band for IBS applications.

Meanwhile, representatives from 14 South Pacific nations are meeting in Sydney, hosted by OTCI, to discuss aspects of Pacific Area Co-operative Telecommunications (Pact).

The particular issue to be settled is bilateral supply agreements leading up to another meeting scheduled for April, the installation and testing of equipment for October-December and the beginning of services by January 1990. The Federal government has offered to inject $A2.6 million into Pact, greatly increasing the economic attraction of the scheme for potential users. OTCI is the carrier and technical co-ordinator/consultant for Pact.

INDUSTRY

Strict standards critical to ISDN acceptance

Graham Shepherd . . . Australian market "very competitive"

By Noel Bennett

SYDNEY — Adhering strictly to international standards was critical to acceptance of ISDN by the marketplace, said Graham Shepherd, deputy managing director of GPT (GEC Plessey Telecommunications (Australia) Pty Ltd).

This adherence was not only imperative to ensure transparent connection between PABXs within a country, but also for connection with PABXs outside that country, he said.

Telecom had established its own standards for PABXs connected via a private ISDN network. However, Shepherd said he believed this was an interim measure pending the setting of international standards. The carrier had already agreed to international standards covering the interfacing of PABXs on the public switched network.

Shepherd's remarks were in response to a report that in the US, users trying to make the "so-called" international standards work were being plagued by the very absence of standards.

One buyer was quoted as saying that when you get products from vendors who have not implemented standards, you can expect to get burned.

Shepherd supported this claim: "If you push a proprietary approach, you could jump on the wrong bandwaggon and, also, the user needs to know that you are in step with standards so you can offer them the best of all the facilities and technology available."

GPT has produced the first PABX to pass Telecom's laboratory testing with its flagship PABX model, the ISDX (Integrated Services Digital Exchange). This equipment is now going through field trails in order to gain full approval for unlimited connection to the Telecom ISDN network, when operational.

The ISDX is no stranger to Australia with units installed by the NSW NRMA, DEC, Wang, Macquarie and Monash universities, Royal Melbourne Institute of Technology and the Victorian TAB.

Shepherd said these companies and institutions were key players in either the use or marketing of high technology equipment and many of them were using the ISDN facilities on the ISDX on their own private networks and were awaiting the introduction of Telecom's ISDN offering to enter the public network. Also, in Britain, a number of GPT's customers were connected to British Telecom's ISDN network, operating in pre-public switched network mode.

As to the reception being accorded the advent of ISDN network, Shepherd said

(Continued page 15)

Timeplex shows benefit of link with Unisys

By Noel Bennett

SYDNEY — In an industry where getting together is increasingly necessary for survival, Timeplex Australia was now beginning to realise benefits from its parent's 12 months' old tie-up with Unisys Corp, according to Timeplex Australia's director and general manager, Garry Fahey.

Timeplex was able to open a Canberra office, linking into Unisys' presence there, and could now tender more easily for Federal government contracts, availing itself of Unisys' corporate relationship agreement with the government, he said.

Further, under the Unisys Networks umbrella, Timeplex had a wider geographic spread with Unisys technical staff being trained in Timeplex's network offerings. Also, Timeplex was working with Unisys to offer its networking skills to present and new Unisys' computer clients, Fahey said.

Operationally, Timeplex Australia still reported to Timeplex Inc, New Jersey, which in turn reports to the Unisys Networks arm of Unisys Corp.

Despite being wholly owned by Unisys Corp, Timeplex continued to work in muti-vendor environments, particularly with IBM computer-oriented organisations.

Timeplex provides equipment and network management support covering the integration of voice and data networks, packet switching, video conferencing and electronic messaging.

Accordingly, in Australia, Timeplex has been affected by the Federal government's May statement last year of new directions in telecommunications.

While Fahey has said that the long-term effectiveness of these changes would depend on the performance of the independent body, Austel, (Communications World, February, p 4), he also said Telecom now had a more relaxed attitude towards private networks.

For example, Telecom previously insisted upon providing first level maintenance of multiplexers in private networks incorporating voice. This threw an additional overhead on network providers to train Telecom personnel. Further, many customers did not want Telecom maintaining their voice/data networks. Under the new regime, this maintenance requirement no longer existed, benefiting both Timeplex and its customers.

Fahey said Telecom had adapted to a more competitive market and organisations were more willing to examine and implement new technologies to complement the services provided by the carrier.

Historically, organisations had been held back by the need to ask "Are we al-

(Continued page 15)

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REGION

UPDATE ON THE ASIAN/PACIFIC COUNTRIES

NEW ZEALAND

University claims world first

WELLINGTON — Victoria University has launched an ISDN project, believed to be a world first, aimed at piping interactive tertiary education into students' homes.

Training in the new video-data-voice system was held last weekend at a hideaway in Marlborough. The 12-student pilot planned last year starts in the Wellington area this term, by simulating an integrated services digital network over triple twisted-pair wiring into the students' homes.

That will be extended to 24 students in 1990, then go nation-wide, changing to fibre-optic cable as soon as it is available. By 1992, it is hoped to have 1000 students networked across New Zealand taking their communications diplomas.

The project is headed by Professor John Tiffin, who holds the David Beattie Chair of Communications at Victoria University.

It has a twin function: to study how best to use the technology for education, and educate students to diploma level by hands-on use of the technology.

The impetus was a study by Dr Lalita Rajasingham, from the Technical Correspondence Institute, who looked at the relationship between economic development and tertiary education. She said that the rapid expansion of tertiary education was critical, that this could be achieved by expanding distance-education, and that using ISDN on a major scale was inevitable.

Tiffin also sees ISDN-based distance education as helping to cure unemployment by reversing its cause.

The other side of the unemployment problem is education," he said.

"Information technology has created unemployment; learning to use it creates employment."

He emphasised the experimental nature of the project, which fitted the brief of the Communications Chair.

"We are seeking the answers; seeking how the old and the new means of communication adjust to each other," he said. "These are communications students. If they were not, there would be no justification in using this method. The way to teach communications technology is to use it."

But Tiffin said the experience gained in the communications courses would enable the technology to be extended to traditional university courses. He wants to have software worked out within the next few years.

The hardware being used at Victoria is a local area network of 10 Hewlett-Packard Vectras. Students are supplying their own PCs — a minimum of an AT with a 20Mb hard disk.

Tiffin wants to use the system for seminars, tutorials, assignments, and examinations. He aims to build a library, starting with an encyclopaedia on CD-Rom; then build on the initial combination of voice, VDU displays, and print by adding video, both still and motion.

For the latter, he said he would love to have Datapoint's Minx monitors in his system (they could double as screens on IBM/compatible PCs). His wish may be granted — Datapoint said it was interested in talking to Tiffin about providing them.

Datapoint marketing director Kerry Meehan agrees with Tiffin's vision of dispersed education via interactive video-data-voice terminals.

"It is certainly the way of the future," he said. "I see the day when every home will have one."

CHINA

Shenda Telephone Company orders 200 pre-pay card phones and 500,000 cards

SHENDA Telephone Company, in Shenzen Province, Southern China, had placed an order with GPT (GEC Plessey Telecommunications) for 200 pre-pay card phones and 500,000 cards.

This represents the largest single order for card phones placed by a Chinese PTT.

The used of stored value cards, which hold from 10 to 100 call units, will allow international telephone calls to be made from public telephones in Shenzen for the first time. Cards also avoid the necessity of needing correct change before making a telephone call.

The order follows an agreement in November 1986 for coin payments. The initial order was to supply the first Western-designed units to accept Chinese currency.

The units are also programmed to accept Hong Kong dollars, so telephone calls can be made in a mix of currencies.

GPT has previously supplied a trial quantity of pre-pay card payphones to the Shanghai Long Distance Telephone Company.

US Sprint sells surplus

LAST month US Sprint and the Ministry of Post and Telecommunications (MPT) of the People's Republic of China signed a contract for China to purchase about $US15 million worth of surplus US Sprint analogue microwave transmission equipment.

The MPT will buy 2000 NEC and Rockwell-Collins radios and 600 Andrew parabolic antennas, which it will use to expand domestic communications networks and increase traffic capacity.

US Sprint personnel will assist in the installation of some of the equipment.

Timeplex shows benefit of link with Unisys

(Continued from page 14)

lowed to do it?" when considering alternatives However, now they were more likely to say "We should be allowed to do it and if not, why?"

That is, providing the technology met Telecom's rigid safety standards and did not impact the network, there was no reason why it should not be implemented.

Fahey said he believed OTC had been quicker in adopting a more dynamic and positive approach to new ways of doing things, influenced by the need both to provide services for international customers and to be the hub for international networking, a market being hotly contended by other countries.

On ISDN, being implemented by national carriers world wide and promoted as the potential answer to users' telecommunications problems, Fahey said this technology should be considered as being one more option — organisations were free to use it either in whole or part.

Timeplex was conducting its own major ISDN field trials in West Germany with varying standards being the one major potential obstacle to its successful worldwide implementation.

Fahey said that, to his knowledge, four standards existed with, for example, the UK adopting different ones to those prevailing on the Continent, presenting potential difficulties in internetworking when Europe became one market as from 1992.

"It will be interesting to see its (ISDN) acceptance and this will depend on its price and what it gives the users," he said.

In the US, a recent survey had indicated many organisations were unsure as to what it was all about and its advantages.

Fahey said the greater stress on network management was one of the major changes occuring over the past few years, driven by the increasing complexity and number of services transmitted over networks.

Besides having its own tools, Timeplex provided interfaces to other proprietary systems, such as IBM's NetView and Software Developments' Net/Master and had signed an appropriate agreement with DEC.

Also, Timeplex had developed an OSI interface so that any OSI compatible protocol could be managed under the one system.

On technical developments, Fahey said packetised voice had reduced the conventional voice transmission speed from 64 down to 8K-bits/sec offering considerable savings on international traffic and also on local circuits, with quality being retained. Banks and other financial services with much overseas voice traffic had become most interested in this technology.

However, as CCITT had yet to set standards, transmissions could not enter the PSTN. This was but a matter of time, Fahey said.

The globalisation of telecommunications presented a keen challenge for Timeplex by providing the expertise and facilities to effectively manage such large networks, requiring operational centres strategically placed throughout the world. Timeplex fulfilled this requirment together with the financial strength that it would be here "tomorrow" to maintain its services.

Strict standards critical to ISDN standards

(Continued from page 14)

that many "sophisticated" customers were quite excited about its advantages. Smaller business users were not actively thinking about its business potential and the next task for the industry was to come up with product which made ISDN exchanges very useful and practical for these potential customers.

Not-so-big businesses required technology just as much as their larger counterparts. Shepherd said, for example, technology by way of extremely powerful personal computers had closed the technological gap between the extremes of business enterprises. GPT in Australia was part of a worldwide team engaged in design and further development of the ISDX. The Australian operation was just about to release an automatic call distributor "which was just as powerful" as any similar unit on the market.

This feature would be incorporated into the international product. At present, GPT's Silverwater factory, in Sydney's west, manufactured something like 50 per cent of each ISDX and then assembled and rigorously tested the product before it was installed, commissioned and maintained.

Shepherd said the Australian ISDN exchange market was very competitive with some seven to eight suppliers contending for the top end. Besides price, availability, features and support, the only way to succeed was being committed to Australian and international standards and to also ensure the product kept pace with the latest technology and capabilities. This required large investment.

One competitor is Telecom through its Fujitsu tie-up. Shepherd said he personally believed the carrier should encourage industry to provide those advanced facilities and equipment for connection to its network and not try and compete with the private equipment sector.

But he added that while GPT competed with Telecom, it had supplied it with major items of equipment for many years and this relationship would hopefully continue. Illustrating the over-riding importance of compliance with authoritative standards, Shepherd said it was possible to pick up a telephone anywhere in the world and talk with some one on the other side — only made possible by the setting and compliance with international telephony standards.

GPT signs agreement

GEC Plessey Telecommunications Ltd (GPT) has become the first telecommunications company to join the Federal Government Partnership for Development Program.

The partnership agreement was signed in Melbourne by GPT's UK parent company managing director Richard Reynolds, and the Minister for Industry, Technology and Commerce, Senator John Button.

GPT will progressively increase its research and development expenditure in telecommunications products to at least 5 per cent of its Australian turnover by 1995/96. Initial R&D will be in the areas of digital data networks, optical fibre network management, PABX, and public telephones.

By 1995/96 GPT's average Australian value-added content for exports will reach 70 per cent.

ANALYSIS

There is no blanket immunisation to safeguard against viruses

By Laura DiDio

ONE of the more unpleasant facts of computer user's life these days is that no foolproof safeguard against viruses exists. And that is not likely to change in the foreseeable future.

Viral vaccines or antidotes usually protect against only one strain of virus and even then, it's a one time immunisation shot. There is no guarantee that the system will not be re-infected by the same, or a different virus. Adding to the users woes is the fact the hackers writing the viruses are finding ways to circumvent the various vaccines within months or even weeks of when they are marketed.

In the wake of the worm that was unleashed last November on the Internet networks, there are now more vaccine vendors (about 30) and products than there are viruses, notes Harold Highland, editor of *Computers & Security* magazine in the US.

> ‘No one is safe. The virus on our disk originated in the manufacturer’

Highland and his associates recently tested 20 of the best-known antiviral filters against actual viruses. While Highland would not disclose specific findings, what he did reveal is not encouraging.

"Some of the antivirus filters or vaccines caused systems to crash when they were installed," he says. "Others took three or four hours to instal, and some required reinstallation if the user decided to add another software program to the system."

So what is a confused and vulnerable user to do?

The answer, according to the experts, is simple and inexpensive: Practise good computer hygiene and use common sense. Here is the list of do's and don'ts:

- Don't accept any software, especially public domain software, of unknown origin.
- Don't instal any software that is not in its original shrink-wrapped package on your system.
- Don't attempt to analyse or play with a suspected virus yourself. To minimise damage, log off immediately and ask for help in analysing the problem.
- Do make backup copies of files on a daily basis.
- Do make sure your organisation has some form of library management that requires users to sign on and off. This will make it easier to locate the source of an infection if it does occur.
- Do use a write/protect tab and restrict write access to your company's systems.

"Good security practices are always the first line of defence," maintains Leslie Fiering, assistant vice-president of advanced technology at Bankers Trust Co.

"But still, it's distressing that shareware programs are being maligned; the virus problem really occurs much more with diskettes and programs of unknown origin. Users can be reasonably certain that if they get shareware directly from the company, then it will be clean. Companies aren't going to sabotage themselves."

Still, she conceded: "It's pretty scary out there now, and even if you follow all the precautions, you can still get hit by a virus."

Fiering and many other users, including *Network World*, found out firsthand recently that even diskettes in their shrink-wrapped packages can be infected. Quantum Leap technologies, a software company, unwittingly sent out infected copies of its Mega Rom public domain software for the Apple Macintosh.

"It is ironic that the Mega Rom was infected, since the disk contains at least a dozen virus protection utilities," observes Robert Burr, president of Quantum Leap Technologies. More than 450 copies of Mega Rom were despatched before a phone call from Apple informed the company that the Mega Rom was infected with the relatively benign n-Vir virus.

In fact, Quantum Leap Technologies was not the source of the virus: The diskette became infected at the pressing plant. "No one is safe. The n-Vir virus that was on our Mega Rom originated in the format utility used by CMS Enhancements Co, the hard disk manufacturer," Burr said.

Despite such incidents, other industry experts believe that human error causes more damage than computer viruses.

"There's more damage being wrought by people making mistakes than there is from computer viruses. Dishonest hackers will never be able to compete with the competent people in the world, either in sheer numbers or the amount of damage they cause," said Robert Courtney, a former IBM director of data security and privacy who now runs Robert Courtney Inc, a New York consulting company.

Courtney recently compiled statistical estimates of security losses based on interviews with several hundred businesses and federal, state and local agencies.

"The results showed that 65 per cent of computer-related security losses are due to user errors and omissions, and only 16 per cent are attributable to dishonesty in any form, including computer viruses," he said.

"Good computer hygiene is a very simple thing to achieve," Courtney added. "If a user suspects his system is infected with a virus, he should disengage immediately. I've seen people crash their entire hard disk simply because they kept on trying to play with the virus to find out what it did."

■ *Laura DiDio works for* Network World

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Network management — what is your definition of its meaning?

By Nathan Cher

NETWORK management is arguably one of the most overworked phrases in the computer industry today. Ask five people what it means, and you will get five different answers.

For our purposes, I will define Lan management as the necessary knowledge, procedures, tools and support to allow a network of PCs to operate effectively on a day-to-day basis. Basically, this type of management is all the tips and tricks needed to keep a Lan running.

It may be software, a comprehensive log book, or a particular way of organising files and menus for network users. In short, it is all those things which make your life as a network manager easier.

A Lan must be seen as a system, and management must be approached in a manner consistent with approaches used in the management of other systems.

Managing a Lan requires some degree of centralisation. How much of the operation you centralise depends on the size of the network and the level of sophistication of both applications and those workers using them — but the correct perspective will help you consider the impact of changes before you implement them.

For instance, application changes on a Lan are not isolated to a single desktop; they also affect other users. Storing information on a server also demands backup procedures often neglected with standalone computers.

Once a Lan is viewed as a single system, it is much easier to handle issues as they arise. To understand the types of issues involved, consider the three primary areas of a Lan that must be managed — servers and gateways, the network fabric itself, and user support.

Each of these areas represents a major component of a Lan. In each, consideration of requirements before they become necessary increase the effectiveness of the Lan, thus helping to make your job as Lan manager so much easier.

Servers and gateways are the backbone of your network, and they need careful management. Novell, 3Com and Banyan all provide excellent software tools, for adding users, administering privileges, and other functions of server and gateway management.

Understand the capabilities and limitations of the server. Reasonable expectations are a critical component of the knowledge you must develop about servers and gateways.

Next, you must understand what procedures you will need to manage the server and gateways properly. For instance, who will be responsible for backup of server-stored files, and how regularly will it be done? Who will assign server log-in names? Who will monitor disk usage and plans for disk expansion?

The number of procedures and the necessary structure of levels depends primarily on the size of your network and the critical nature of the Lan you are implementing. Look for tools that help you do your job.

Lan vendors are adding special features to standard server and gateway software to aid in server and gateway management. A range of third-party products are also available to improve your management capabilities. Utilities exist to monitor disk use, generate accounting and usage reports, and simplify interfaces.

Finally, you should consider the consequences of a server or gateway failure. How much downtime can your organisation afford? The more critical the Lan, the better support you need. Can your users fix their own problems? Or do you need a service contract? Do you even need a permanent, on-site maintenance engineer?

Most management issues relating to the fabric of the Lan (the cabling, interconnections, and so on) should be handled before the system is installed. However, if the Lan grows, or cable capacity problems arise, you must be in a position to handle the situation.

Again, it is essential that you have as much knowledge at your fingertips as possible. Understand what you can expect from the cabling you have installed.

The right tools

The right tools are important too. Diagnostic software is available that will show any extra network capacity and help to isolate networking failures. It is worthwhile having a selection of these tools at your disposal.

Finally, consider the effects of system faults and their effect on your Lan. How will you isolate problems, and how much downtime can you tolerate? Depending on the need, you may have to design some redundancy into the system.

User support is an area of network management so often overlooked. Customers typically measure productivity by how much work users get done, rather than how many packets are moved over a network.

Users expect a higher level of support with a Lan than in a standalone situation.

There are two ways to reduce the amount of time spent on user support. Quality training will reduce the number of general enquiries. You should then get your users to deal with the easier, day-to-day problems. Training support team-members also helps greatly.

There are also a large number of software tools available to help you centralise user support. Some have been designed to allow you to create a "help desk".

Here, again, procedures are important. Think carefully about the following questions. Who do users call when they have problems? How will you track the time you spend supporting users? How will you recover the costs incurred in supporting your users?

As with any job, the right tools make all the difference. The same is true for Lan management. More and more tools — both software and hardware — are becoming available to help you with management issues in all three categories I have discussed here.

There are no hidden secrets to successful Lan management. Simply understand what you are trying to accomplish, implement procedures to achieve these goals, and keep a constant lookout for tools designed to make your management job easier.

■ *Nathan Cher is technical manager, Com Tech Communications.*

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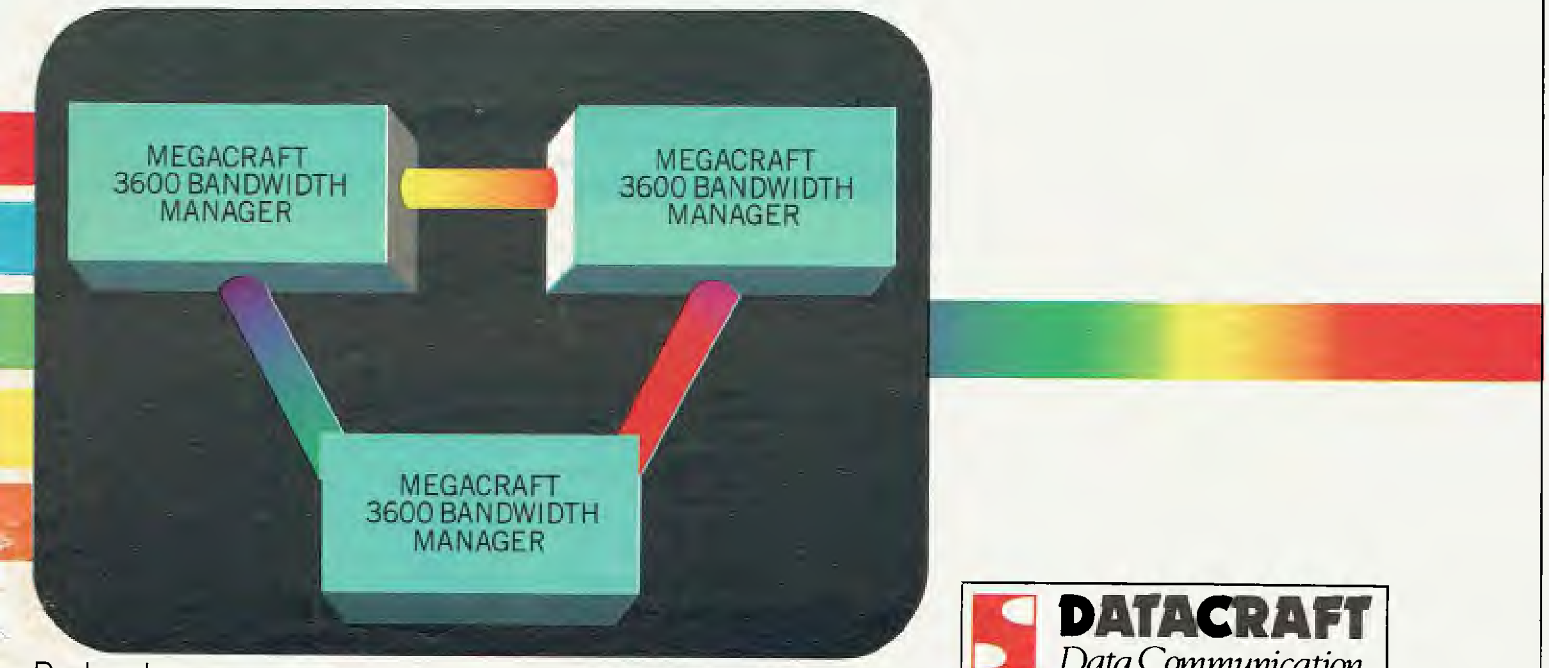
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ANALYSIS

Computer viruses have all the ingredients of science fiction

By Donald Davies

Donald Davies . . . sees Trojan horses

A MYSTERIOUS infection that spreads from machine to machine over communication networks and can be spread from one disk to another. It has all the ingredients of science fiction. It spreads through the news media even faster, rivalling flying saucers in its appeal to the imagination. What is the extent of the menace? Will it continue to spread and what, if anything, can be done?

Clearly it is not just a story because serious computer experts are voicing their concern, but is it inherent in computers to be subject to infection and why has it surfaced only recently?

Destructive programs have always been with us, sometimes we innocently write a program that runs amok because of an error and destroys data or itself.

Some of these destructive programs are deliberate mischief, like the "software bomb" that destroys on some event, like the date on the realtime clock reaching Friday.

It is easy to make destructive programs, the clever bit is to conceal them in an innocuous looking utility. Then they are known as "Trojan horses" because they gain entry inside something you want, or even accept as a gift. None of these is new but neither are they viruses because they do not have the property of spreading.

Now the real viruses do not appear by mutation of programs, they are carefully designed for their role. The destructive bit is easy but the method of spreading requires some ingenuity and, because the infection has to be concealed, the method of hiding the virus needs some thought.

> *Personal computers have operating systems that might have been designed with viruses in mind*

The virus is no more than an extra piece of program that, on some particular event, like a disk access, reproduces itself inside another program. A different and less frequent event triggers the effect by which it becomes known.

Benign viruses simply display a funny message — nasty ones destroy data. By delaying the visible effect the virus is able to reproduce a lot before anyone starts to eradicate it. Diseases with a long latency are difficult to eradicate and virus designers learnt from them.

To become invisible, viruses are made to hide in parts of the storage media that are normally only accessible to the operating system, like the tracks on a disk that hold its red tape. From this vantage point they can do things an ordinary user cannot do and probably does not know about.

Though there is no mystery about how they work, it is surely remarkable that a program change can be almost invisible yet self-reproducing and responding to two different stimuli. The answer is that personal computers have operating regimes that might have been designed with viruses in mind.

Whoever designed them has a lot to answer for. The reason for this stupid mistake is the craving for everything to be adjustable — for hooks everywhere in case a change is needed, and as many of these features as possible to be accessible for the advanced programmer.

Just for one example, any point of entry to the operating system can be trapped and call diverted to the infecting program, but PC designers have made it specially easy and documented all the places where it can be done. The operating system is loaded from a disk to make changes easy. All this helps the virus designer. It is not necessary, for there are PCs with their essential programs read only from unchangeable Rom, but they are a minority.

Viruses have generated virus experts and innoculation programs. The latter are a great game because they catch the viruses they know about and spur on virus designers to invent new ones they cannot catch. In all the verbiage that has been devoted to viruses since they became news, simple precautions are never mentioned — they might destroy part of the mystery.

In one hour long TV program experts galore talked about viruses and just one sound piece of advice appeared and was passed over. The speaker held up a piece of the tape used to write protect a disk and said "This is my virus preventer". A good backup copy that is write protected is too obvious and simple a precaution. It spoils the story.

Since it became good copy, everything possible has had the virus label hung on it. A long story in a technical paper by one sufferer turned out to be due to a hardware fault in his PC.

A Christmas message which persuaded users to run a program which replicated the message to all their list of correspondents clogged up networks but was not a true virus.

Now that so many people have used their creative energy to make a "better" virus, improving our systems and operating regimes to avoid their effects is very difficult. We have the wrong habits and the virus creators are very resourceful. The infection resistant PC will lack some of the old flexibility. For a majority of users this will not matter and the virus resistance will be a big bonus. Is there a market for it?

Viruses are not a mystery. They can be avoided by a strict operating regime. More important, a PC system could be designed which traded some of its flexibility for virus resistance and the ability to recover easily from an attack.

This should always have been the aim of designers and they are to blame for the way they opened the systems to attack. Fortunately, ultimate flexibility has not been an aim of mainframes and those brought up with them, so we can already, from the epidemiology of computer viruses, see the mistakes of PC design.

The virus is only one form of software attack. Apart from those we have mentioned — bomb and Trojan horse — there are many ways to attack software.

By changing a program any programmed security measure can be bypassed or subverted. For example, the attack can be made by those who designed or wrote the software in the first place.

If you need a reliable system, software integrity measures start with the first programmer on the job and continue with program audit and with authentication and integrity checking whenever it is used.

A secure system needs cryptographic protection for its software and at least one part of the security must be done in trusted hardware. This is a far cry from the way PC users behave, which shows just how insecure they have become.

● *Donald Davies is one of the most respected computer professionals in the world. Many will recognise him as the person who invented packet switching back in the 1960s. He will be presenting seminars on computer network security for Housley Computer Communications in Sydney on 8-10 March and in Melbourne on 13-15 March.*

Security specialists called in a doctor

MELBOURNE based PC-Plus Systems, a security packages specialist, has taken a novel approach to detecting computer viruses — it employed a doctor.

Dr David Bennett, a specialist physician, collaborated with the software company in the development of pcMedical, a computer diagnostic package. The combined software/support service system supposedly embraces traditional human ailment detection and treatment principles — it detects an infection, determines its nature, prescribes a course of treatment, and provides a pharmacy to dispense them.

The prognosis? That will cost you a couple of cents short of hundred dollars to find out. And, no — it's not covered by Medicare.

Conflict rises over TransAtlantic EDI scheme

A TransAtlantic movement to merge European and US electronic data interchange (EDI) standards is generating conflict and anxiety among various user and industry standards bodies that are implementing older versions of the standard.

The idea behind EDI is to standardise the formatting of commonly used business documents such as invoices and shipping notices so that they can be sent directly from one business computer to another system.

The International Standards Organisation has released the first few pieces of a proposed worldwide EDI standard called EDI for Administration, Commerce and Transport (Edifact). The standard is designed to supersede both Ansi X.12, which has emerged as the US EDI standard, and the Article Numbering Associations's Tradacoms, which is widely used in Europe.

However, on both sides of the Atlantic, user organisations — particularly US companies that have recently begun migrating to X.12 — are reluctant to migrate to Edifact, according to Victor Wheatman, manager of EDI Planning Services at Input — the Mountain View, California-based research company.

"It would be nice to have one EDI standard, but it would also be nice to have the whole world speak Esperanto," he said, drawing an analogy to the century-old attempt to encourage use of an international language.

It had been hard enough for various industry groups to migrate to X.12 from their own EDI protocols, which were designed specifically for their particular type of business and often preceded the Ansi standard, Wheatman said.

However, most industries had accepted the need for X.12 to provide links with other types of business — between manufacturers and shipping companies, for example. Each industry also retained its own EDI subset of industry-specific formats, Wheatman said.

But now, such companies were under siege to perform yet another migration to an international EDI standard, and they may be reluctant to do so, Wheatman said. Companies with foreign trading partners may use X.12 domestically and Edifact with their overseas partners, or they may rely on third-party services to translate between the two protocols, he said.

Edifact was formally endorsed by the US Customs Service, both for the agency's own internal use and in the interests of foreign trade, Wheatman said.

Unfortunately, the agency's endorsement angered Ansi, which felt that the Customs Service should endorse the existing X.12 rather than the unfinished Edifact, he said.

"Edifact only has a few transactions approved and ready for use," Wheatman said.

The Edifact movement is also encountering resistance in Europe. The Tradacoms standard is said to be solidly entrenched among the UK's EDI users, who make up 70 per cent of the total European EDI installations, according to The Yankee Group, a Boston-based research company.

However, a catalyst for change in the UK might be the European Community's (EC) plan to abolish economic borders in Europe in 1992.

Currently, UK EDI users deal primarily with companies within UK boundaries, but the EC plan is focusing their attention on international trade, both across Europe and beyond.

> *Users must take control of the standards debate*

The EC commission said it believed the creation of a single European market could be worth $250 billion a year, boosting Europe's gross domestic product by five per cent. European organisations were therefore beginning to view EDI as an important tool to help them become more effective players.

But while they accept EDI as a way forward, many are unwilling to take standards responsibility upon themselves. The majority use third-party network suppliers for transmission of EDI messages, and many think the problem of standards is one for the suppliers to solve.

One such vendor might be IBM, which offers EDI services in the US, UK, France, Denmark and Italy. IBM's European EDI services support both the Edifact and Tradacoms standards.

Keith Blacker, systems manufacturing manager at UK electronics company Lucas Industries PLC, said users must take control of the standards debate because of the commercial implications of using EDI. Lucas was using Edifact in a limited way while it waited for the standard to become more widely accepted, Blacker said.

ANALYSIS

Client-server philosophy is latest move in Lans organisation

By Beverly Schwartz

THE client-server philosophy is the latest in a line of attempts to organise the structure of database sharing between PCs on local-area networks (Lans), and of distributed databases on wide-area networks (Wans). What exactly is the client-server architecture?

The initial products, marketed using this terminology, were standalone, single user Database Management Systems (DBMS) which resided at the user's site. These database management programs were separated from the database itself, which resided at another site controlled by a file server utility.

The user application passed a request for data to the DBMS which sent it over the network to the database site asking the file-server for the information.

For example, a user might initiate a query requesting information about all employees in the company who earn more than $100,000. The company has 3000 employees, but only 10 of them earn is this salary bracket.

The user's request for the information is passed to the DBMS. The DBMS realises that to answer the query, it requires the employee file, and formats a request to the file server to send it the employee's information.

The file server sends data on all 3000 employees over the network to the DBMS, as it has no internal logic for eliminating any of them. The DBMS may then reduce the number of records required to solve the problem to the 10 employees who satisfy the request.

Multithread architecture

This is a very inefficient method of database access, as there is considerably more traffic on the network than necessary.

This architecture is still commonly used for database servers, especially when single user DBMS on a network want to share data.

The users do not share a DBMS, they only have access to the same data on a set of files. Since there is no real management of the files, integrity controls are crude — the file is in use or not in use.

The more sophisticated controls that a DBMS normally executes must be performed remote from the data site, and therefore will not be as effective.

More recently, a second form of database server has come on to the market. The server is a single DBMS, controlling a database which resides at its site — it has replaced the file server.

The client is the enduser whose application is divorced from the server and database site. The server performs all database access on behalf of client processes who send their database access requests to the server for processing.

This is accomplished by use of a routing facility residing at the client's site which redirects the requests over the network.

The network contains only one database server site, managing a database residing at its site.

Using the same example above, the user wanting the employee information has the routing program direct the request to the DBMS site.

The DBMS accesses the database at its site, solves the query and then sends only the information on the 10 employees satisfying the query over the network, rather than that on all 3000 employees, thus significantly lowering the network overhead and improving response time. This architecture is very popular at present; new products are being announced on an almost weekly basis.

One way a database server gains the capability to manage multiple users' database requests, is for it to be created using a multi-threaded architecture, able to service many clients in parallel.

Beverly Schwartz is a US consultant who specialises in distributed database systems. She conducts seminars for Housley Computer Communications on "Database and Networking", and will be presenting them in Sydney on 22-26 May and in Melbourne on 3-7 July.

The server controller, when it receives a database request over the network, initiates a proxy client task, called a shadow process. This subtask, which executes at the server site, represents the client and communicates directly with the server; such as read/write requests for data.

The DBMS contains a scheduler to determine the status of each client shadow process (in wait state, processing, accessing and database.)

The DBMS, together with the client shadow processes, comprise the product which is called a database server in today's marketplace.

Some more advanced servers utilise features of the operating system, such as multi-tasking and shared memory, A server which is designed to use multi-tasking is divided into separate functions, each of which is self-contained, but works co-operatively with the other processes to provide the full functionality of the server. The operating system provides multi-tasking-multi-threading of the server tasks. Examples of tasks into which a server may be split are database reading, database cleanup (recovery and rollback), database writing and the like.

These processes do not communicate directly to each other, rather communication is accomplished via shared memory buffers, containing such things as cache information and locks.

The client shadow processes access the database by inserting requests into shared memory queues, which are examined periodically by the relevant server modules.

This philosophy can show significant performance improvement over earlier database servers, because database access may be bypassed on queries if the data has previously been obtained and is already resident in a shared memory read cache, and also because of the parallel processing capability of handling multiple client requests simultaneously by the different processes of the DBMS.

In multi-tasking servers, all the server task components, together with the shared memory and all client shadow processes is marketed as the database server.

With a database server, multiple users can co-operatively access the same database, which, since it is separated from the users' applications, can reside on a larger machine. The users may be on PCs, the database engine may reside on a minicomputer or mainframe.

One advantage of this method is that data integrity and security can be better controlled, as the database is isolated from the user sites, and the manager of the data is at the data site.

The disadvantage of the server is that it is really a centralised database manager — a single site controls all the data. Therefore, it has potential system bottlenecks (all database accesses are channelled from a single source at a single CPU, and has single program criticality (if the DBMS is down, the network is unavailable).

There are variations of the database server architecture, where the server provides a gateway to another database — perhaps on a mainframe. Using this technique, the enduser can invoke a query, and have it transparently channelled, via the Lan server, to the host database.

A gateway, as defined by DBMS vendors, is a piece of software, normally provided by the vendor of one DBMS, which sits in front of a "foreign" DBMS at the destination site. The function of this software is to convert the request, when it arrives over the network, to make it look as if it was a request for the "foreign" database.

The gateway converts the server request into the structure of the "foreign" DBMS, passes the request to that DBMS, receives the answer, and converts it back to the format of the requesting database manager.

Gateways are one-way mappings — if a server on a Lan has provided a gateway into a host DBMS, an enduser of the host DBMS wil not be able to use the gateway in reverse to query information on the server's database.

Gateways, as they are implemented today, are tools for making queries of remote databases; they do not provide any remote update capability, as they do not participate in any of the protocols of the other site, such as locking.

More recently, multi-server DBMS have been introduced. A multi-server DBMS consists of a database which is shared and managed by more than one DBMS in the network — the database may be accessed by more than one controlling source. This may be achieved by use of shared disk hardware features incorporated into the client-server architecture, such as in a mini-computer disk cluster.

As soon as more than one DBMS is allowed to manage the same data, there is the possibility of contention between them. To alleviate this problem, the Star Site architecutre has been developed. The distributed database manager (DDBMS), or Star Site, channels the activities from the local database servers so they do not conflict with each other, and resolves any potential conflicts between local DBMS sites accessing the same data.

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DEC extends wiring support and cuts bridge solution price

DIGITAL Equipment Corporation has announced 802.3/Ethernet capabilities on IBM shielded twisted pair cable, support for the emerging EIA Wiring Standard, and price reductions of up to 45 per cent on its popular bridge solutions.

For those customers who invested in IBM's cabling system. DEC's shielded twisted pair Ethernet adapter provides 10M-bits/sec 802.3/Ethernet functionality to the desktop over IBM's shielded twisted pair type 1, 2, 6, 8 or 9 cable.

Users of workstations or personal computers connected to shielded twisted pair cable can now access DEC's Ethernet devices directly in a wiring closet. They can use DEC's popular network-based software, including Decnet/OSI, Vax/VMS Services for MS-Dos, and the IBM 3270 Terminal Emulators software, without rewiring their building or offices.

One adapter, located in the user's office, converts ThinWire Ethernet signals from the desktop device for transmission over the shielded twisted pair. The office adapter can support up to four personal computers or workstations connected in a series. The other adapter, located in the satellite equipment room or wiring closet, provides the conversion back to ThinWire Ethernet.

In addition, the support of shielded twisted pair wire compliments the other DEC Deconnect Ethernet media choices, which include baseband and broadband coaxial cable, ThinWire Ethernet, unshielded twisted pair, microwave, and fibre-optic links. This means that customers have the flexibility to choose cabling systems and to grow their networks incrementally with the assurance that their networking components are compatible.

Further extending its commitment to standards and media independence, DEC also announced its support of the emerging Electrical Industries Association (EIA)/American National Standards Institute (Ansi) Building Wiring Standard.

Final approval of the standard is expected by both bodies shortly. The EIA Wiring Standard specifies three wiring media to the desktop:

- Four-pair unshielded twisted pair.
- IEEE 802.3-specified coaxial.
- (IBM) shielded twisted pair.

DEC claims it is the only major vendor poised to offer support of all three defined standard desktop data communications media.

Hewlett-Packard, 3Com form strategic alliance

NEW YORK — Hewlett-Packard and 3Com Crop have released the details of a strategic alliance covering six areas of product development and marketing and an international service agreement.

The companies will begin delivery of industry-standard compatible computing products in the second half of this year.

3Com and HP wiill work together to promote Microsoft Corp's Lan Manager as a standard across multiple platforms. HP has signed a letter of intent for an OEM agreement for 3Com's 3+Open, which will become the basis of the HP 3+Open Lan Manager, HP's OS/2 Lan Manager-based tools that will enable Dos and OS/2 workstation users to communicate with users on other computers supporting the TCP/IP protocol.

Australian companies wasting big money on inadequate cable

A LEADING expert in computer cable management has warned that Australian companies are wasting hundreds of thousands of dollars through inadequate planning for computer data cabling.

Murray Baker, managing director of Digilink Systems Pty Ltd, said he knew of one North Sydney-based computer company which recently spent $50,000 on installing inadequate cabling for their computer network before occupying new premises.

"It has meant that from day one, the company has been involved in constant upgrading of cabling with all the extra cost and the dislocation to office routine that that involves," Mr Baker said.

"It is a problem that is inherent in the building and construction industry. The present provisions for data cabling and network requirements are simply not enough. Quite often it is addressed as an afterthought."

Mr Baker said that builders, electrical engineers and architects in particular, should account for data cabling requirements as they do for electrical power, telecom and security.

He warned that it was also essential that the building and design professions understood fundamentals such as interference caused by crossing electrical and data cables.

"Frankly, I am amazed at the number of new buildings I have seen that have no data capacity at all or, if they do, it is inadequately designed," Mr Baker said.

"Ideally, the accommodation of data cabling should be addressed by experts to ensure a trouble-free, long-term installation."

Mr Baker attributes the current phenomenon to the computer industry not educating builders to the importance of adequate data cabling provision.

Murray Baker . . . blames building industry

"Computers have been around for long enough now and it's absurd that such problems still exist," he said.

"It is up to the computer industry to take the lead in this matter."

Mr Baker said a significant proportion of his company's work came from rectifying data cable problems caused by "professional ineptitude, if not professional incompetence."

And rectifying these problems came at considerable financial cost and disruption to company operations.

"Apart from inadequate cabling provision, many companies have installed the wrong type of data cable," he said.

Overlap likely of EISA token ring adapters, MCA sister cards shipments

WESTBORO, Massachussets — Spring deliveries of 16M-bit/sec token ring adapters optimised for the Extended Industry Standard Architecture (EISA) bus are expected to overlap with initial shipments of sister cards designed for machines with the AT and Micro Channel Architecture (MCA) buses.

Compaq Computer Corp is working closely with token ring vendor Proteon and other suppliers of network adapters as to assist them in building EISA cards.

According to Nate Kalowski, Proteon's vice-president of marketing, which cards are delivered first is mostly a matter of which chip maker can ship in volume first — Texas Instruments, with its 16M-bit/sec token ring chip set, or Intel which is supplying the EISA chip.

Kalowski confirmed that Proteon is developing an EISA bus-mastering card from the ground up that will be able to operate at either 4M- or 16M-bit/sec. Bus mastering enhances performance by routing data of the network directly into system memory and eliminating read and write operations to the direct-memory access controller. It also offloads this activity from the system CPU.

Proteon demonstrated a 16M-bit/sec. MCA card in autumn and plans to support both platforms. It was too early to set pricing for cards for either bus, Kalowski said.

He said the vendor was considering an EISA adapter for its nonstandard 10M bit/sec token ring as well.

"The EISA platform is a good fit for token ring technology because of the performance of its 32-bit bus and I/O, which makes for a good file server for data- and graphics-intensive applications," he said. "We believe that EISA will be a major player."

Confirmation of Compaq's efforts with network adapter card suppliers follows reports from sources close to Compaq and Novell that the two are considering a deal that would allow Compaq to reference-sell Novell's Netware 386 network operating system with Compaq's 33MHz server based on Intel's 80386 processor. Both products are expected to ship in the second or third quarter.

There is some speculation that Compaq might be positioning itself for a run at the workgroup server market. Users are increasingly employing 386 computers as file servers on local networks, and Compaq is the No 1 seller of 386 boxes.

Novell has long-standing relationships with both Proteon and Compaq and said this week that it planned to deliver an EISA driver for its software once EISA machines were shipping in volume. Neither Novell nor Proteon sell server hardware.

No quick results in sight from the link between Apple, DEC

NEW YORK — Apple Computer and DEC said this week that their alliance would spawn jointly developed products but cautioned that endusers with an immediate need to connect Apple's Macintosh personal computers to DEC's Vax minicomputers should consider third-party offerings.

"We have engineers working, and engineers build products," said Pierre LeClerc, a product marketing manager at Apple. "But don't make any assumptions about packaging or distribution — they might not be the kind of products you buy off a retail shelf. They might be more in the line of services."

Apple and DEC officials said their engineers had been working diligently since their joint development agreement was announced. They declined to elaborate on what form the new products will take. The comments were made at a Dexpo East '89 conference for endusers on the Apple-DEC partnership.

Earlier this month, an Apple spokeswoman said the DEC-Apple alliance would not necessarily yield products. She said the focus of the joint development was to establish guidelines for third-party developers.

Corporate customers have criticised Apple and DEC's failure to introduce products after slightly more than a year of work together. Endusers might be heartened by this week's promise of products co-developed by Apple and DEC. However, no introduction dates were promised.

Instead, the partners are encouraging customers with pressing needs not to wait. "It is not our intention necessarily to come in and replace what already exists. We're providing developers with architectural information on a daily basis," said Blake White, an Apple product marketing manager. "It's not as though you're taking a risk."

Despite the advice, corporate customers are less than pleased with third-party products. "With third parties, there's always the issue of, will it work?" said Jack Mulligan, systems manager at *The Boston Globe.* "When there's been a change in the hardware's operating system, we've had problems with third-party products."

Also, Mulligan said, third parties tended to offer erratic service compared with more established vendors such as Apple and DEC.

Fibre optic backbone for Wollongong Uni

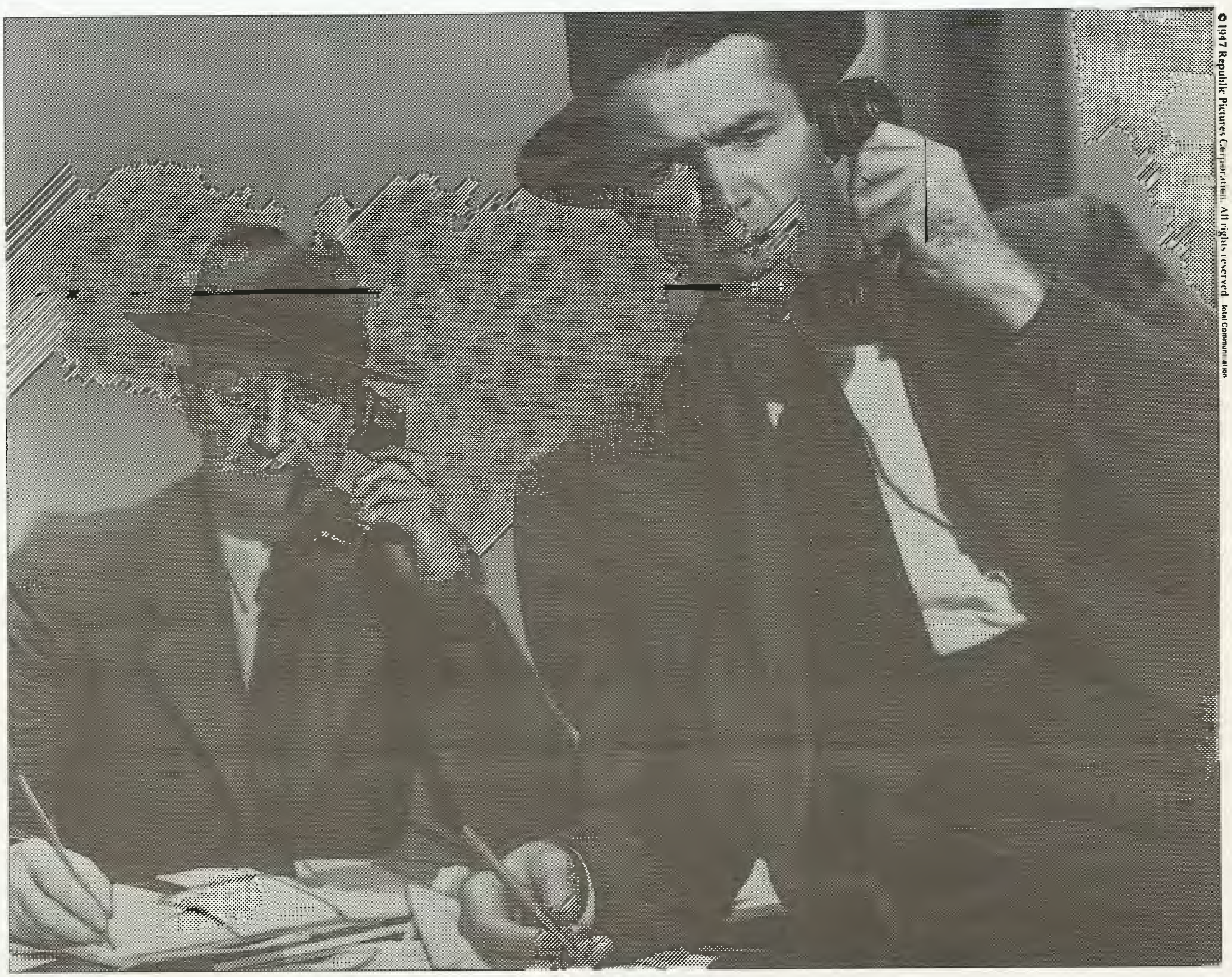
DATAMATIC has successfully commissioned an extended distance local-area Ethernet network at Wollongong. The network will permit faculties at the university to share resources.

The Lan uses a fibre optic backbone based on the proven Whisperlan active transceivers, which, in conjunction with the fibre, overcomes problems associated with earlier coaxial and wire based technologies.

The backbone operates at 40M-bit/sec and lends itself to easy upgrade to FDDI. The fibre optic backbone will support existing equipment and newly installed Novell Lan facilities, as well as computer protocol servers.

The extended distance capability of the Whisperlans can permit a single 8 kilometre ring or bus and up to 270 square kilometres of network.

If only all telephone systems could create networks.



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ERICSSON

Lans action boosted by 16 M-bit/sec Token Ring

By Leo Risbridger and Peter Court, Advanced Systems Group, ACI Computer Services

THE surprise announcement by IBM in November of the 16M-bit/sec Token-Ring has dramatically improved the performance of local area networks.

IBM aims to attract the bulk of new Lan installations to the 16M-bit/sec product. In Australia the price of the new 16M-bit/sec card is actually slightly cheaper than the current 4M-bit/sec Micro Channel cards. The 4M-bit/sec cards have now dropped in price to make them more attrative.

The current 4M-bit/sec Token-Ring technology is the fastest selling Lan technology today, due to its numerous desirable features, including: reliability, performance, cabling flexibility, network management and IBM connectivity.

Despite these advantages, there is still a need for better performance in many cases, particularly in two main areas.

First, with more and more users relying on Lan file servers to provide program and data storage, the peak transfer rate across the Lan must be capable of providing close to local hard disk performance.

Switchable adapters

With today's local drives achieving 10M-bit/sec, a 4M-bit/sec (real throughput) Lan cannot match this even for one workstation taking data off one server.

Second, as an increasing number of devices — including PCs and terminals — share the Lan, the total average requirements could easily exceed the capacity of a Ring. This is particularly applicable as newer applications appear in the database and graphics area which can have staggering requirements.

The introduction of IBM's 16M-bit/sec Token-Ring has made it possible to achieve transfer rates across the Lan that will be the same as, if not better than, a local hard disk. The Lan protocol is no longer the limiting factor in transferring data across the Lan.

It is possible to mix 16M-bit/sec and 4M-bit/sec adapters on the same physical ring without any additional software or hardware upgradess. However, the 16M-bit/sec cards will have to be switched down to run as 4M-bit/sec adapters, as each ring can only run at a single speed.

It is also quite practical to have some 16M-bit/sec rings and some 4M-bit/sec rings, with bridges between them.

The New 16M-bit/sec adapter card dramatically improves the basic transfer rate from 4M-bit/sec to 16M-bit/sec. It also has a number of important functional enhancements that are mainly available when the adapter is operating in 16M-bit/sec mode.

These include increased adapter resources and additions to the ring protocol which allow better exploitation of the ring bandwidth (overcoming some latency issues which appear at such high speeds).

Hardware available includes:

- IBM Token-Ring Network 16/4 Adapter/A. This is the Micro Channel version of the 16M-bit/sec adapter card designed to use with the IBM Models 50,60,70 and 80. The adapter card is switched between 16M-bit/sec and 4M-bit/sec via the PS/2 Micro Channel POS setup software.
- IBM Token-Ring Network 16/4 Adapter. This is the IBM PC version of the 16M-bit/sec adapter card to be used in IBM PC, XT, AT and PS/2 30. This card is switched from 16M-bit/sec by the use of DIP switches on the adapter card.
- IBM 8220 Optical Fibre Converter. The current 4M-bit/sec and 16M-bit/sec.

The IBM Lan Support Program (LSP) has been upgraded to support the new 16M-bit/sec and 4M-bit/sec Token-Ring Adapters. However, when operating the new cards at 4M-bit/sec the IBM Lan Support Program 1.02 can be used instead.

IBM OS/2 Extended Edition 1.1 will be supplied with the necessary device drivers to support the operation of all IBM Token-Ring Adapters including the new 16M-bit/sec adapters.

IBM Token-Ring Network (Local) Bridge Program V2.0 provides bridging capability between two local IBM Token-Rings networks with a number of data rate combinations.

The primary function of the bridge program is to connect multiple rings into a single logical network, to display the ring status and detail any errors. It also maintains performance statistics and provides a network management capability by sending notification to the IBM Lan Manager over 2.0.

When a machine on one ring wishes to communicate with a machine on a different ring via the IBM Token-Ring Bridge program the first machine "broadcasts" a message to all attached requesting the location of the other machine.

Once the responding machine has replied with its network address any data can be sent directly to each machine without involving a large overhead of processing in the bridge program. This single-route broadcast method makes for a very efficient bridging program.

The IBM Token-Ring Bridge program V2.1 will support all functions provided by V2.0 as well as supporting the bridging of remote Token-Rings via the use of leased lines and SDLC protocols. When configured as a remote bridge, frames are transferred between two rings via a leased line operating at speeds form 9.6k-bit/sec to 1.344M-bit/sec.

Two complete sets of equipment are required to be dedicated to the task when configured as a remote bridge.

The IBM Token-Ring Bridge program V2.1 also provides the capability of filtering frames forwarded by the bridge. A high-level language API is provided which allows users to create complex and powerful filtering algorithms for either performance or security reasons.

To utilise the remote bridge, an IBM X.25 Interface Co-processor/2 is required with the appropriate interface module. However, the SDLC protocols are used in a dedicated point to point manner, instead of the X.25 protocols.

The announcement by IBM has major implications in the Lan marketplace. It shows once again how fast technology can move in this industry, and the speed and the aggressive pricing have taken many commentators by surprise.

It should be a long time before a competing technology appears at the workstation level. Some see the 100M-bit/sec fibre optic FDDI as the next generation product, but it is unlikely that a cost effective PC or PS/2 card will be available for many years to come (if ever!). The standard is not yet firm, and current estimates for the initial connection are at about US$10,000 each.

Unisys announces a range of software to connect to a wide range of systems using other vendors' products

UNISYS has announced a range of software products to connect its U Series of Unix based systems to a wide range of other vendors' systems.

The range of industry standard network environments that can interconnect with the U Series now includes TCP/IP Ethernet or Token Ring local area networks, Decnet, Sun Microsystem's Network File Server, and Oracle's SQL*Net for distributed database communications.

The Unisys Open Systems strategy for U Series has already catered for Open Systems Interconnect (OSI) inter-operability, the US Department of Defence's DDN wide area network and IBM's SNA.

The Unisys Decnet Interconnect Product (DNI) allows networks based on Decnet to be interconnected with Unisys U 5000 and U 6000 processors.

"DNI allows the U Series systems to be attached easily into a Decnet network, appear to the network as a DEC system, and share the network's resources," said Peter Bruen, marketing manager for Unisys Australia.

"Users can access and transfer files on any system in the network, communicate with applications on other DEC Vax systems and assist in managing the network.

"In addition, Vax terminals on the network can simultaneously access files and resources on U Series equipment, which is critical to users wanting a migration path to open systems solutions," he said.

He said PC Interface (PCI) Token Ring enhancements had been added to the existing Unisys PCI platform, of which more than 1200 were sold last year for Ethernet and RS-232 based systems.

PCI enabled users to capitalise on their existing experience with MS-Dos-based systems while centralising hardware resources such as printers and disk storage.

A virtual terminal emulator accessed the U Series application environment to execute Unix applications, database and communications products, he said.

PCI features included transparent disk emulation and print emulation for the PC, and access to U Series system capabilities as shared resource processor.

Network File System (NFS) had become a de facto industry standard to share resources in a TCP/IP Ethernet network, with Unix and non-Unix systems. More than 75 network vendors had adopted the system, he said.

NFS allowed file sharing among computers from different vendors, running a variety of operating systems and eliminated the drawbacks inherent in Lan-based information sharing.

"It means Unisys now offers the two most common Unix networking systems across our whole range," Mr Bruen said.

The company had added Oracle Corp's SQL*Net and SQL*Menu to the latest Unisys offering of Oracle products.

"We have a high regard for the Oracle-database facilities," Bruen said. "The addition of SQL*Net to our lineup increases our ability to provide solutions across multiple networked U Series systems. We also now offer SQL*Menu enabling application developers to migrate their systems to U series platforms.

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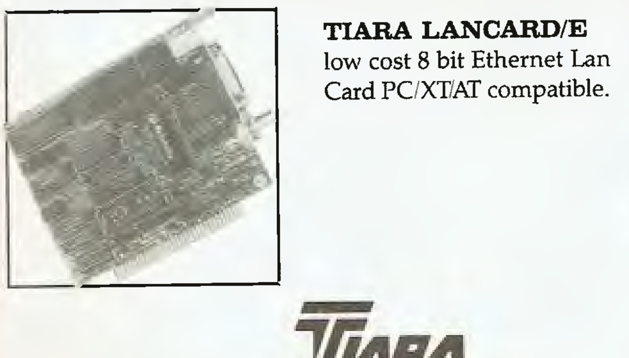

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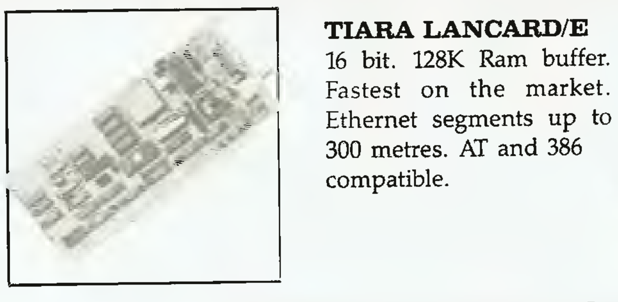

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ADE

BUYER'S GUIDE

LAN BOARDS

Compiled by
Gillian Sidebottom

Product/Manufacturer	Price ($A inc tax)	Compatibility	Form factor (half/full card)	Data transfer rate (M-bytes/sec)	O/S standards supported	Cable types	Maximum number workstations/hub	Topology	Protocol/ signalling method	Network software	Other features/Comments
ADE Computers Pty Ltd — 2 Dublin St, East Oakleigh, Vic 3166.											**Tel: (03) 543 2677**
Lancard/E, Tiara	$438	IBM PC/AT or comp	Half	10	MS-Dos 3.xx	Coax AUI	—	Ethernet	CSMA/CD	Novell 2.xx	• TCP/IP optional; • Autoboot Rom available.
16-bit Lancard/E, Tiara	$954	IBM AT or comp	¾	10	MS-Dos 3.xx	Coax AUI	—	Ethernet	CSMA/CD	MS Lan Manager, Novell 2.xx	• TCP/IP optional; • 128K Ram.
PS/2 Lancard/E, Tiara	$954	IBM PS/2 (60, 70, 80)	Full	10	MS-Dos 3.xx	Coax AUI	—	Ethernet	CSMA/CD	Novell 2.xx	• TCP/IP optional; • Full Micro Channel compatibility.
TW Lancard/E 16-bit, Tiara	$954	IBM AT or comp	Full	10	MS-Dos 3.xx	Twisted pair	—	Ethernet	CSMA/CD	Novell 2.xx	• TCP/IP optional.
Lancard/A, Tiara	$312	IBM PC/AT	Half	2.5	MS-Dos 3.xx	Coax	16	Arcnet	Token passing	Novell 2.xx	• Includes LED network activity indicator.
Lancard/A-HIZ, Tiara	$492	IBM PC/AT	Half	2.5	MS-Dos 3.xx	Coax	8	Linear	Token passing	Novell 2.xx	• Linear Arcnet using no hub.
Lancard/A PC HUB, Tiara	$954	IBM PC/AT	Full	2.5	MS-Dos 3.xx	Coax	4	Arcnet	Token passing	Novell 2.xx	• Arcnet card with builtin four-port hub on single card.
Lancard/A MC, Tiara	$954	IBM PS/2 (60, 70, 80)	Full	2.5	MS-Dos 3.xx	Coax	16	Arcnet	Token passing	Novell 2.xx	• Autoboot socket; • LED network activity indicator.
Lancard/A MC HIZ, Tiara	$954	IBM PS/2 (60, 70, 80)	Full	2.5	MS-Dos 3.xx	Coax	8	Arcnet	Token passing	Novell 2.xx	• 8 PS/2 connections without use of a hub.
Lancard/A MC FO, Tiara	$954	IBM PS/2 (60, 70, 80)	Full	2.5	MS-Dos 3.xx	Fibre optic	16	Arcnet	Token passing	Novell 2.xx	• Cable lengths of up to 1500m.
AT&T — 7th Floor, 155 Queen St, Melbourne, Vic 3000.											**Tel: (03) 670 7077**
Starlan 10Mb and 1Mb	$US495/295	AT&T 6300, IBM XT, AT, PS/2 and comp	Half	10/1	—	Twisted pair, Coaxial, Fibre	11	Star wired bus	URP (1Mb) ISO (10Mb) CSMA/CD	—	—
Comp Tech Communications Pty Ltd — 72 Erskine St, Sydney, NSW 2000.											**Tel: (02) 290 3477**
Interlan NI5210	—	Ethernet	Half	10	NetWare, Banyan, Sun PC/NFS, 3Com etc.	Twisted pair, Thin/tnick Ethernet	64-250	Bus/Star	CSMA/CD	Novell, IPX/SPX. PC-NFS, TCP/IP, Netbios. Lan Manager	• 8/16K dual ported Ram; • Remote boot Rom available.
Interlan NP600a Protocol Processor	—	Ethernet	Full	10	NetWare, Unix, Xenix, MS-Dos	Twisted pair, Thin/thick Ethernet	64-250	Bus/Star	CSMA/CD	Novell, IPX/SPX, TCP/IP, ISO/OSI, Netbios, Lan Manager	• 512Kb Ram; • 80186 Processor; • 16-bit board; • To 64Kb EPROM.
Interlan N19210 Micro Channel controller	—	Ethernet	Full	10	NetWare	Twisted pair, Thin/thick Ethernet	150-250	Bus	CSMA/CD	Novell, IPX/SPX, TCP/IP, ISO/OSI, Netbios, Lan Manager	• 16-64Kb Ram; • 80186 Processor; • ADF configuration file.
Interlan NP100/200 (Dec Vax)	—	Ethernet	Qbus, Unibus	10	VMS	Thin/thick Ethernet	150-250	Bus	CSMA/CD	TCP/IP	—
Interlan NP300	—	Ethernet	Multibus	10	Unix V.2	Thin/thick Ethernet	150-250	Bus	CSMA/CD	TCP/IP	—
Interlan NP600	—	Ethernet	Full	10	Unix V.3, Xenix	Thin/thick Ethernet	150-250	Bus	CSMA/CD	TCP/IP	—
Interlan NP700	—	Ethernet	VMEbus	10	Unix V.3, Xenix	Thin/thick Ethernet	150-250	Bus	CSMA/CD	TCP/IP	—
SMC PC120	—	Arcnet	Half	2.5	NetWare, Vianet, Netbios	Coaxial	255	Star	Token passing	Novell Netware, IPX/SPX, Netbios, Vianet	• Remote boot Prom available.
SMC PC220	—	Arcnet	Half	2.5	NetWare, Vianet, Netbios	Coaxial	255	Bus	Token passing	Novell Netware, IPX/SPX, Netbios, Vianet	• Remote boot Prom available.
SMC PC260	—	Arcnet	Half	2.5	NetWare, Vianet, Netbios	Twisted pair	8	Daisy chain	Token passing	Novell Netware, IPX/SPX, Netbios, Vianet	• Remote boot Prom available.
SMC PC500FS	—	Arcnet	Full	2.5	NetWare	Coaxial	255	Bus/Star	Token passing	Novell Netware, IPX/SPX	• NODAL priority scheme; • 16-bit board; • Dual ported Ram; • Diagnostic LEDs.
SMC PC500WS	—	Arcnet	Full	2.5	NetWare	Coaxial	255	Bus/Star	Token passing	Novell Netware, IPX/SPX	• 16-bit board; • Dual ported Ram; • Diagnostic LEDs; • High speed interface.
Datamatic DP — 16 Suakin St, Pymble, NSW 2073.											**Tel: (02) 488 8066**
Novell NE1000	$780	8-bit PC/XT/AT bus Novell NetWare	Half	10	NetWare	Thin/thick Ethernet	100	Linear	CSMA	NetWare	—
NE2000	$906	16-bit PC/XT/AT bus NetWare	¾	10	NetWare	Thin/thick Ethernet	100	Linear	CSMA	NetWare	—
NE/2	$906	MCA bus interface Novell NetWare	Full	10	NetWare	Thin/thick Ethernet	100	Linear	CSMA	NetWare	—
PDI 508 Plus — Puredata	$450	8-bit PC/XT/AT bus Novell NetWare	Half	2.5	NetWare	Coax	20/hub	Star ring	Token passing	NetWare	—
PDI C508/Puredata	$1168	MCA bus, NetWare	Full	2.5	NetWare	Coaxial	20/hub	Star ring	Token passing	NetWare	—
PDT 508/Puredata	$997	Toshiba T1200, T3100, T5100	Half	2.5	NetWare	Coaxial	20/hub	Star ring	Token passing	NetWare	• Arcnet card for Toshiba laptops.
PDT 8023/Puredata	$997	Toshiba T1200, T3100, T5100	Half	10	NetWare	Coaxial, Thick/thin Ethernet	100/server	Linear	CSMA	NetWare	• Ethernet card for Toshiba laptops.
P1303 (Pronet 10)/Proteon	$1117	8-bit PC/XT/AT	Full	10	NetWare	—	12	Token Ring	Token passing	NetWare	—
P1340 (Pronet 4)/Proteon	$1299	8-bit PC/XT/AT	Full	4	NetWare	IBM type 1, 2, 6	8	Token Ring	Token passing	NetWare	• IBM Token Ring compatible.
P1344 (Pronet 4)/Proteon	$1299	16-bit PC/AT	Full	4	NetWare	IBM type 1, 2, 6	8	Token Ring	Token passing	NetWare	• IBM Token Ring compatible.
P1840 (Pronet 4)/Proteon	$1732	MCA Bus, IBM PS/2 50, 60, 70, 80	Full	4	NetWare	IBM type 1, 2, 6	8	Token Ring	Token passing	NetWare	• IBM Token Ring compatible.
NL1000/Novell	$501	8-bit PC/XT/AT	¾	24	NetWare	—	32	LocalTalk (Mac)	CSMA	NetWare	• Provides Macintosh connectivity with NetWare.
Codenet 3051/Codenoll	$1920	8-bit PC/XT/AT	Full	10	NetWare	Fibre optic	100/server	Linear	CSMA	NetWare	• Fibre optic Ethernet card.
Disc Computer Systems Pty Ltd — Suite 503, 3 Thomas Holt Drive, North Ryde, NSW 2113.											**Tel: (02) 805 1155**
Excelan	PoA	PC bus, Qbus, VME bus, Unibus, Multibus, PS/2	Full	10	Unix, Xenix, PC/MS-Dos, VMS	Thin/thick Ethernet	—	Bus	TCP/IP, IPX	Includes: FTP, Telnet, Unix R-Utilities, Netbios, Electronic mail	• Xenix-net, NetWare and Oracle compatible.
Exogen Business Tools Pty Ltd — 229 Gouger St, Adelaide, SA 5000.											**Tel: (08) 211 7922**
DNA Networks Product I	$1162.75 (master) $692.95 (station board)	IBM PC/XT/AT	Half	1	Dos, Netbios, Novell	Twin shielded, Twisted pair	64	Daisy chain	CSMA/CD Netbios	DNA networks	• Non dedicated master, print spooling & queuing; • Message switching, log-on and passwords, network diagnostics.
DNA Networks Product II	$1632.55 (master) $927.86 (station board)	IBM PC/XT/AT PS/2 & comp	Half	2.5	Dos, Netbios, Novell	Twin shielded, Twisted pair	64	Daisy chain	CSMA/CD Netbios	DNA networks	• Non dedicated master, print spooling & queuing; • Message switching, log-on and passwords, network diagnostics.

KEY: ✓ = heading applies; — = heading not applicable, or information not supplied; PoA = price on application; comp = compatible.

The Buyers' Guide: Lan Boards is based on information provided by respondents to a survey of vendors conducted between Deccember 1988 and February 1989. All details should be checked with the companies as listed.

BUYER'S GUIDE

LAN BOARDS

Product/Manufacturer	Price ($A inc tax)	Compatibility	Form factor (half/full card)	Data transfer rate (M-bytes/sec)	O/S standards supported	Cable types	Maximum number workstations/hub	Topology	Protocol/ signalling method	Network software	Other features/Comments
Hewlett-Packard Australia Ltd — 31-41 Joseph St, Blackburn, Vic 3130.											**Tel: (03) 895 2675**
HP Starlan 10	$1360	HP Vectra PC, IBM PC/XT/AT PS/2(30)	Half	10	MS-Dos, MS-Net, Netbios, HP Advancenet	Twisted pair	12	Star	CSMA/CD	HP Office-Share	• Can work with HP3000 minicomputers as part of Lan, • Also works with EICON card to ease access to X.25 connections and SNA environments.
HP Starlan	$760	HP Vectra PC, IBM PC/XT/AT PS/2(30)	Half	1	MS-Dos, MS-Net, Netbios, HP Advancenet	Twisted pair	11	Star	CSMA/CD	HP Office-Share	—
HP Thinlan	$1650	HP Vectra PC, IBM PC/XT/AT PS/2(30)	Half	10	MS-Dos, MS-Net, Netbios, HP Advancenet	Coaxial	—	Bus	CSMA/CD	HP Office-Share	—
IBM Australia Ltd — Coonara Ave, West Pennant Hills, NSW 2120.											**Tel: (02) 634 9111**
IBM Token Ring Network Trace & Performance Adapter	$2830	IEEE 802.5, 802.2	Full	4	PC-Dos, OS/2, AIX	IBM (1, 3, 6, 9)	260/ring	Logical ring, Physical star	802.5 Token passing	IBM Lan support program, OS/2 Extended edition, v1.1	—
IBM Token Ring Network Trace & Performance Adapter/A	$2615	IEEE 802.5, 802.2	Full	4	PC-Dos, OS/2, AIX	IBM (1, 3, 6, 9)	260/ring	Logical ring, Physical star	802.5 Token passing	IBM Lan support program, OS/2 Extended edition, v1.1	—
IBM Token Ring 16/4 Adapter/A	$1610	IEEE 802.5, 802.2	Full	4 or 16	PC-Dos, OS/2, AIX	IBM (1, 3, 6, 9) — 4 IBM (1, 6) — 16	260/ring	Logical ring, Physical star	802.5 Token passing	IBM Lan support program, OS/2 Extended edition, v1.1	—
IBM Token Ring Adapter II	$1350	IEEE 802.5, 802.2	Half	4	PC-Dos, OS/2, AIX	IBM (1, 3, 6, 9)	260	Logical ring, Physical star	802.5 Token passing	IBM Lan support program, OS/2 Extended edition. v1.1	—
IBM Token Ring Adapter/A	$1350	IEEE 802.5, 802.2	Full	4	PC-Dos, OS/2, AIX	IBM (1, 3, 6, 9)	260	Logical ring, Physical star	802.5 Token passing	IBM Lan support program, OS/2 Extended edition, v1.1	—
IBM PC Network Baseband Adapter	$1043	IEEE 802.2	Full	2	PC-Dos, OS/2	IBM (1, 2, 3, 6, 8, 9)	80	Mixed tree & daisy chain	CSMA/CD Baseband	IBM Lan support program, OS/2 Extended edition, v1.1	—
IBM PC Network Baseband Adapter/A	$1040	IEEE 802.2	Full	2	PC-Dos, OS/2	IBM (1, 2. 3, 6, 8, 9)	80	Mixed tree & daisy chain	CSMA/CD Baseband	IBM Lan support program, OS/2 Extended edition, v1.1	—
IBM PC Network Frequency 2 Adapter/Frequency 3 Adapter	$1136	IEEE 802.2/802.3, *	Full	2	PC-Dos, OS/2, AIX	75ohm CATV Coax	3000	Tree	CSMA/CD Broadband	IBM Lan support program, OS/2 Extended edition, v1.1	— * *MAP, TOP, CAT V.2 & 0 or 3 & P.*
IBM PC Network Adapter II, II/A	$1261	IEEE 802.2	Full	2	PC-Dos, OS/2, AIX	75ohm CATV Coax	3000	Tree	CSMA/CD Broadband	IBM Lan support program, OS/2 Extended edition, v1.1	—
Mitsui Computer — 14 Aquatic Drive, Frenchs Forest, NSW 2086.											**Tel: (02) 452 0452**
QuickLink IV	$3374	IBM PC/AT	Full	16	MS-Dos	RS232	4/card	Star	Netbios	Novell, Powerlan, Network O/S	—
Cubix — QuickLink I	$1409	IBM	Full	16	Dos 3.xx	RS232	1/card	Star	AT I/O, Bus transfer	Novell NetWare, Network O/S	• 768K Ram.
Shuttle Datacomm Pty Ltd — 464 St Kilda Rd, Melbourne, Vic 3004.											**Tel: (03) 267 1011**
Accton EtherPair-16	$952	PC/AT comp	Half	10	Dos, DEC, Unix. TCP/IP	Unshielded twisted pair	8/hub, 256 total	Star/bus	IEEE 802.3, 10 Base T	LanSoft, Novell. 3Com. Netbios	• Autosensing 8 or 16-bit bus supported.
Accton EtherCoax-16	$749	PC/AT comp	Half	10	Dos, DEC, Unix, TCP/IP	Twin coax	—	Bus	IEEE 802.3	LanSoft, Novell, 3Com, Netbios	—
Accton EtherPair-MC	$1265	PC/2 Micro Channel	Full	10	Dos, DEC, Unix, TCP/IP, OS/2	Unshielded twisted pair	8/hub, 256 total	Star/bus	IEEE 802.3, 10 Base T	LanSoft, Novell, 3Com, Netbios	—
Accton RingPair-16	$1248	PC/AT comp	Full	4	Dos	Unshielded and Type 1 twisted pair	8/hub	Star	IEEE 802.5	LanSoft, Novell, Token Ring, Netbios	—
Accton EtherCoax-MC	$1208	PS/2 Micro Channel	Full	10	Dos, DEC, Unix, TCP/IP, OS/2	Thin coax	—	Bus	IEEE 802.3	LanSoft, Novell. 3Com, Netbios	—
Accton EtherPair-8	$792	PC/AT comp	Half	10	Dos, DEC, Unix, TCP/IP	Unshielded twisted pair	8/hub, 256 total	Star/bus	IEEE 802.3, 10 Base T	LanSoft, Novell, 3Com, Netbios	—
Soft Centre Pty Ltd — 40 Jolimont Terrace, East Melbourne, Vic 3002.											**Tel: (03) 654 1977**
SMC-PC260/ Standard Microsystems Corp	$610	IBM PC/XT/AT PS/2 (25. 30) 386	Half	2.5	Novell. Bos-Lan, Lan Manager	Twisted pair	255	Star/bus	Token passing	Novell NetWare, Bos-Lan, Lan Manager	• Surface mount technology; • Designed for Star & Daisy chain networks using twisted pair wiring.
SMC-PC220/ Standard Microsystems Corp	$690	IBM PC/XT/AT PS/2 (25, 30) 386	Half	2.5	Novell, Bos-Lan, Lan Manager	Coax	255	Bus	Token passing	Novell NetWare, Bos-Lan, Lan Manager	• Surface mount technology; • Designed for Bus topology networks.
SMC-PC120	$564	PC/XT/AT PS/2 (25, 30) 386	Half	2.5	Novell, Bos-Lan, Lan Manager	Coax	255	Star	Token passing	Novell, Bos-Lan, Lan Manager	• Surface mount technology; • Designed for Star topology networks.
SMC-PC110	$1095	PS/2 (50, 60, 70, 80)	MCA	2.5	Novell, Bos-Lan, Lan Manager	Coax	255	Star	Token passing	Novell, Bos-Lan, Lan Manager	• Surface mount technology; • Designed for use in Star topology network.
SMC-PC 500WS	$1129	IBM PC AT 386	Full	2.5	Novell	Coax	255	Star/bus	Token passing	Novell, Bos-Lan, Lan Manager	• 16-bit high performance board designed for use in a workstation in a star or bus topology network.
SMC-PC 500FS	$1420	IBM PC AT 386	Full	2.5	Novell, Bos-Lan, Lan Manager	Coax	255	Star/bus	Token passing	Novell NetWare, Bos-Lan. Lan Manager	• 16-bit high performance board utilising nodal priority; • For use in a file server in a star or bus topology network.
Sysygy Computer Systems Pty Ltd — 2/875 Glenhuntly Rd, Caulfield, Vic 3162. — Level 7, 4 Help St, Chatswood, NSW 2067.											**Tel: (03) 528 6311 Tel: (02) 413 1588**
Dove FastNet III	$1123	Ethernet IEEE 802.3	Internal Nubus (Mac II)	1.5	AppleTalk, Decnet, TCP/IP, AlisaTalk, Starlan, PacerShare	Thickwire & thinwire	100	Bus	CSMA/CD	Community, Decnet, Dove, TCP/IP, TOPS, AppleShare, Microsoft, Mail. Novell, E-Mail	• Nubus card with 16K Rom, 64K Ram and the Lance Ethernet controller.
Dove FastNet II	$1636	Ethernet IEEE 802.3	Internal Nubus (Mac II)	1.5	AppleTalk, Decnet, TCP/IP, AlisaTalk, Starlan, PacerShare	Thickwire & thinwire	100	Bus	CSMA/CD	Community, Decnet, Dove, TCP/IP. TOPS, AppleShare, Microsoft, Mail, Novell, E-Mail	• Intelligent internal communications controller for Mac II; • Nubus-based 10MHz 68000 CPU, 512K Ram, 64K Rom.
Dove FastNet SCSI	$2246	Ethernet IEEE 802.3	External box connected to SCSI port	1.5	AppleTalk, Decnet, TCP/IP, AlisaTalk, Starlan, PacerShare	Thickwire & thinwire	100	Bus	CSMA/CD	Community, Decnet, Dove, TCP/IP, TOPS. AppleShare, Microsoft, Mail, Novell, E-Mail	• Intelligent controller with 10MHz 68000 CPU, 512K Ram, 64K Rom
Dove Marathon Lan 020	$2736	Ethernet IEEE 802.3	Internal slot (Mac SE)	1.5	AppleTalk, Decnet, TCP/IP, AlisaTalk, Starlan, PacerShare	Thickwire & thinwire	100	Bus	CSMA/CD	Community, Decnet, Dove, TCP/IP, TOPS, AppleShare, Microsoft, Mail, Novell, E-Mail	• Combination Ethernet adapter and 68020, 16MHz accelerator on a one-slot multi-function card for Mac SE only; • Optional 68881 maths coprocessor and/or 1-4Mb on board Ram
Dove FastNet SE	$1123	Ethernet IEEE 802.3	Internal card (Mac SE)	1.5	AppleTalk, Decnet, TCP/IP, AlisaTalk, Starlan, PacerShare	Thickwire & thinwire	100	Bus	CSMA/CD	Community, Decnet. Dove, TCP/IP, TOPS, AppleShare, Microsoft. Mail, Novell, E-Mail	• 16K Rom, 64K Ram, Lance Ethernet controller.
Unisys Australia Ltd — 30 Alfred, St, Milsons Point, NSW 2061.											**Tel: (02) 963 6000**
Token Ring Lan Card	PoA	All XT, AT, 386, and comp	Half	4.0	MS-Dos 2.xx, 3.xx, Usernet	Dual twisted pair	256	Token Ring, IEEE 802.5	Token Ring	Usernet/286. NetWare 2 11	• Remote load Prom available; • Extend by bridging up to 256 Data/Print or Communications servers per Lan.
Ominet Twisted Pair Card	PoA	All XT, AT, 386, and comp	Half	1.0	MS-Dos 2.xx, 3.xx, OS/2, Usernet	Single twisted pair	100/Lan	Bus	CSMA/CA	Usernet/286, NetWare 2.11	• Remote load Prom available; • Extend by bridging Lans up to 8 data/print servers per Lan.
Y-Micro — 1 Hasler Rd, Herdsman Business Park, Osborne Park, WA 6017.											**Tel: (09) 244 2888**
Compex Inc	$380	SMC (Arcnet)	Half	2.5	Dos 3.3, Dos 4.0	Coaxial, Twisted pair	255	Bus/Star	Token bus	Novell NetWare, Compex NetWare	• Twisted pair cabling and Micro Channel versions available.

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TELECOMMUNICATIONS

CARRIER SERVICES, PABX, VOICE SYSTEMS, BYPASS

Carriers to offer ISDN services

By Barton Crockett

ARLINGTON, Virginia — A high-level AT&T executive disclosed this week that the company was working with carriers in the UK and Japan to offer international Integrated Services Digital Network services.

At the International Communications Association's (ICA) Winter 1989 seminar here, Rodney Strum, AT&T's director of international marketing, said the carrier was working with British Telecommunications Plc in the UK and Japan's Kokusai Denshin Denwa Ltd (KDD), an international carrier, to offer international ISDN Basic Rate Interface service. Strum said the carrier would probably announce the project in two months but had not yet filed a tariff for the service.

Currently, AT&T offers domestic ISDN Primary Rate Interface service but has not yet introduced Basic Rate Interface service. The Basic Rate Interface, or 2B + D, standard supports two 64k-bit/sec bearer channels for voice and data and an out-of-band signalling channel.

Users at the conference said the agreement would be a major boost for ISDN and would greatly expand its reach by letting users communicate with sites globally over the integrated voice/data networking system.

Executives from several other major carriers said the reach of ISDN would be extended even further through other global ISDN interconnectons now in the works.

Strum said that, in the next several months, AT&T would announce an ISDN interconnection to Telecom Canada, an Ottawa-based organisation comprising major Canadian communications carriers.

In addition, Michael Ford, president of British Telecom International, the US subsidiary of British Telecom, said his company was arranging ISDN interconnections with public carriers in West Germany, France and Italy.

Ford said that AT&T and British Telecommunications Plc had approached other carriers about interconnecting ISDN services. He said both companies pitched the idea in a recent meeting with representatives from 20 carriers from around the globe.

'Fortress Europe' in telecommunications feared by US

IDG News Service, European bureau
By Amiel Kornel

PARIS — European progress toward realising the old dream of a unified economic market has sent a jolt through the world telecommunications industry and may spark a trade war between the European Community and the US.

One of the cornerstones of European Community plans to remove most trade barriers between its 12 member nations by December 31, 1992, is the progressive liberalisation of telecommunications equipment and services markets.

US industry and government officials, while attracted by the possibility of selling to a single market of 320 million consumers, are fearful of a post-1992 "Fortress Europe" impervious to US exports.

"The 1992 initiative is . . . being watched in the US and elsewhere with apprehension as well as excitement," said Oswald Ganley, executive director of the program on information resources policy at Harvard University.

In recent weeks, transAtlantic trade tensions have been growing. The US Government reportedly informed the EC in late January that it was named as a "priority country" for investigation under the US Telecommunications Trade Act.

EC officials counter US allegations that US telecommunications companies have restricted access to the EC market by noting that Europe's trade deficit with the US in this sector has been growing and stands at $US570 million.

The simmering trade battle comes as major industry players from Europe and North America are struggling to form alliances with smaller companies that dominate once-protected national markets.

TCC strategic for Alcatel

By Laurie Zaat

SYDNEY — Completion of the first stage of Tasman-2, a fibre optic submarine cable venture between Australia's OTC and the Telecom Corp of New Zealand, by the Tasman Cable Company (Alcatel-TCC). was the cornerstone for Alcatel's penetration into the submarine fibre optic cable market in South-East Asia and the Pacific, according to the general manager of Alcatel-TCC, Bruce Stephens.

Tasman-2 is a 2200km cable connecting Sydney and Auckland, providing a transmission rate of 560M-bits/sec. The project prompted the formation of the TCC, a joint venture of Australia's Alcatel-STC, and France's Alcatel-CIT and Les Cables de Lyon.

Stage 2 construction and laying of the cable is to be completed, ready for service, by the end of 1991.

TCC's $100 million investment in the project will see it emerge as one of Australia's largest exporters of manufactured equipment, establishing a new export industry for the country, being one of only five such manufacturers in the world.

With the Auckland-Hawaii link going to tender in 1990, to be followed by the Sydney-Guam link, TCC will be well placed to share in the world undersea cable market, worth some $5 billion.

OTC also plans to extend its links to Singapore and Europe. By the turn of the century it is estimated half of the world's undersea cable will be laid in the southern hemisphere.

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TELECOMMUNICATIONS

Three US States set to ban advertising via fax machines

By Bob Brown

HARTFORD, Connecticut — Legislators in at least three US States have filed bills to regulate or ban the practice of distributing advertisements via facsimile machines, labelling the practice more of a nuisance than junk mail.

Legislators in Oregon, Washington and Connecticut have proposed bills to halt the increased flow of ads sent via facsimile machines. Unsolicited facsimiles tie up users' machine when crucial messages could be sent or received, and they pin facsimile recipients with the cost of facsimile paper required to receive messages.

Options for regulating unsolicited ads distributed by facsimile include an outright ban, limitations on the time during which they can be sent or restrictions on facsimile machines that automatically dial other facsimile machines for major distributions.

Oregon's Joint Interim Task Force on Telecommunications submitted a bill to the State's House of Representatives that said: "No person shall use a machine . . . to transmit unsolicited advertising material for the sale of any realty, goods or services."

If approved, the legislation would allow Oregon's attorney general or county district attorneys to investigate violators. The court could also order offenders to pay restitution to victims, or the victims could file a civil suit for damages, whichever is greater. Connecticut is pondering similar penalties in legislation filed in January.

Alternative legislative approaches being considered by Connecticut include encouraging self-regulation on the part of telemarketers, many of which already keep lists of people who do not wish to be contacted by direct mail firms, according to Kevin McCarthy, a Connecticut research analyst.

A spokeswoman for Oregon's Senate Committee on Telecommunications and Consumer Affairs said the facsimile Bill is a proactive measure. The Senate has not yet heard many complaints from facsimile users about unwanted messages, she said.

Industry observers said some of the largest offenders are vendors of facsimile-related products, such as paper.

Bernie Thiel, director of public communications for the Association for Systems Management in Cleveland, said he has been subjected to a regular flow of unwanted press releases from assorted public relations companies since his organisation bought a facsimile machine last year.

"It's not a big problem, but I could see how it might get worse," Thiel said.

Ericsson shows dramatic profit increase for 1988

STOCKHOLM — Sweden's LM Ericsson announced yesterday that it recorded 1.84 billion Swedish kroner ($US290 million) in pretax profit for 1988, up 66 per cent compared with 1.11 billion kroner ($US175 million) a year earlier.

Profit rose in all its divisions — led by the public telecomunications and cellular telephony units — except defence systems, according to the company.

Order bookings during 1988 reached 35.6 billion kroner ($US5.6 billion). up from 33.4 billion kroner ($US5.3 billion) a year earlier, Ericsson said.

Sales fell 3 per cent from 32.4 billion kroner ($US5.1 billion) to 31.3 billion kroner ($US4.9 billion) due to divestitures.

OTCI signs contracts for South Pacific Dama system, Inmarsat earth station

OTC International has signed a contract with the Adelaide based company Codan Pty Ltd, for the provision of a Demand Assigned Multiple Access (Dama) system which will be the heart of the new South Pacific telecommunications network.

The contract affirms OTCI's commitment to the Pacific Area Co-operative Telecommunications (Pact) Network program. Pacific island nations which intend to participate in the program can now proceed with plans to access the network.

The $A2.2 million software and hardware contract was signed by John Dennis, executive engineer satellite services engineering for OTC and Allan Gobolos, general manager, satellite communications division, for Codan.

OTCI, the overseas operations and marketing arm of OTC, is developing the regional Dama service for the South Pacific and received wide approval for the concept at the South Pacific Forum Meeting last year.

The Dama system will be installed at OTC's Sydney earth station at Oxford Falls later this year.

The Dama system uses a centralsed computing facility to allocate a circuit to each user on a call by call basis. The call accounting feature of the system will automatically record the connection made and users are charged accordingly. The Dama technique of handling calls maximises the use of the space segment and as a result is ideally suited for telecommunications applications that generate low traffic volumes.

Codan is a wholly owned Australian company established in 1959, with proven design and manufacturing capabilities in satellite telecommunications equipment. Codan will support the project with Australian manufactured that equipment designed and developed by the US company, Sattel Technologies Inc.

The system consists of one online and one offline computing system, as a backup, to ensure service availability and network security are maintained at a very high standard.

The Dama system will be one of the most advanced in the world, allowing a mix of earth stations with antenna sizes from 4.5m to 32m to interconnect with each other in an efficient manner, regardless of their location in the South Pacific. The system has the capacity to simultaneously operate a wide variety of telephone exchanges.

The system will be fully compatible with Intelsat's analogue Vista satellite system with the ability to adapt to future digital Vista.

In a separate announcement, OTC has awarded a $A5 million contract to Sydney-based Asea Brown Boveri (ABB) for the Inmarsat earth station to be constructed at Gnangara, 150 kilometres north of Perth. The contract represents the first move into satellite communictions for ABB in Australia.

The Inmarsat facility will provide a "dual ocean" communications link to ocean-going vessels between the Indian and Pacific oceans. The service, of significance to drilling rigs, freighters, survey vessels and yachts, will include telephone, telex, fax, television as well as data transfer on a ship-to-shore and shore-to-ship basis.

Stage 2 of the Inmarsat project will link mobile land users, aircraft and shipping via direct satellite telecommunications with similar facilities.

Institute solving the problems of linking two widely separated campuses

THIRTY-FIVE kilometres separate the two campuses of the Chisolm Institute of Technology in Melbourne. Despite the obvious advantages in siting the campuses where the students are, the distance has, in the past, presented some formidable difficulties and costs.

Now Chisolm has taken steps to eliminate at least some of these problems by selecting two ISDX telephone systems from GEC Plessey Telecommunications (GPT) to manage its communications.

The two campuses will be hooked together by a 2 million bit/second link, and will in effect operate as if run by a single PABX system.

As an added bonus, the institute is enhancing the performance of one of its operators, who is blind, by installing the GPT Blind Operator Console.

Altogether Chisholm has purchased 650 analogue and 64 digital extensions for its Caulfield campus, and 232 analogue and 12 digital extensions for Frankston.

The head of Chisholm's department of robotics and digital technology, Jim Breen, said Chisholm selected GPT's ISDX because it was a competitive third generation PABX which offered many more features than some other products on the market.

"It is especially good at data handling, which is important to us, and is the system being installed in a number of other tertiary institutions, which could have strategic implications for us.

Chisholm has the largest commercial data processing teaching facility in Australia, with a teaching staff of 50 and hundreds of graduates each year. Data traffic between the two campuses is heavy, and therefore expensive.

"The ISDX gives us a very cost effective way to handle data transmission. We will have permanent digital connections between the two campuses, initially using two 64K-byte channels. With the ISDX and the digital link, we will get 15 times the data and voice transmission capacity for an extra Telecom bill of only $10,000 a year."

Breen said the Caulfield campus operator, who had worked with Chisholm for the past 11 years, was legally blind and a member of the blind operators group within the Victorian Institute of the Blind.

"She was very impressed with the GPT blind operator's console. She said the voice synthesiser gave her plenty of information which she could turn off if required," Mr Breen said.

"At the moment we need three operators between the campuses. With the ISDX systems installed, we could have a single operator to handle both campuses, if necessary".

Breen said the ISDX system would provide increased efficiency and give better service to callers. The institute would also be able to achieve better accounting of the cost of both local and trunk calls.

Oftel commissions more research into numbering

LONDON — Britain's Office of Telecommunications, Oftel, recently commissioned research organisation Ovum Ltd to conduct the second phase of a study on numbering arrangements for voice telephony and other telecommunications services.

Ovum was asked to produce a recommendation for the future approach to numbering for core telecommunication services including fixed main network services, mobile services and data network services in the UK, which will last at least until the year 2020. The company is also expected to formulate a method to administer this scheme.

The first phase of the study revealed that the current numbering scheme of the UK Public Switched Telephone Network — which is based on British Telecom's old electro-mechanical network — was reaching the end of its useful life more quickly than had been anticipated. Major causes of this have been the introduction of new services such as the Cellnet and Vodaphone cellular networks, which have used up many of the remaining national numbering groups, and increased customer demand for number-hungry services such as Centrex and direct-dialling-in.

Present numbering schemes can inhibit competition because, for example, customers must have their numbers changed when switching from one public telecommunications operator to another, as when they change from being British Telecommunications customer to being a Mercury customer.

Although a new national numbering system is unlikely to be introduced until the mid-1990s, extra capacity will be needed in London next year.

Case completes gateway contract for Telecom net

SYDNEY — Case Communication Systems has completed a $A1.5 million order to supply switching equipment for Telecom's international teletex gateway.

The equipment was installed to provide a gateway on the teletex network, allowing interconnection between the national teletex network, Austpac and the international teletex data network.

The Case CSX 1024 message switch provides protocol and signalling conversion between the teletex network, the domestic public X.25 packet switching system and international networks.

The teletex service has been running nationally for 12 months and the gateway has carried trial traffic for six months.

The teletex service provides for the transfer of text documents, spreadsheets, databases and graphics files, created on either a word processor or personal computer, to both national and international destinations. Additionally, computer files and software can also be transmitted.

The service offers immediate communication between computer systems such as IBM, Apple or Wang. It also allows communication between different word processing packages on these systems.

Teletex in Australia can also interwork with the telex service and since November 1988, can send messages to facsimile terminals worldwide.

The Australian teletex service conforms to the international standards which, with the Case gateway in place, allows communication with teletex-capable terminals across the nation and to or from overseas countries where teletex is established.

The teletex network in Australia is supported on Telecom's newest digital AXE telephone exchanges. It operates as a free standing, separate network, accessible from virtually anywhere in Australia.

PRODUCTS & SERVICES

THE LATEST FROM VENDORS AND CARRIERS

PRODUCT REVIEW

Hoskyns Group releases cbt package for communications

MORE and more organisations are turning to computer based training (cbt) to spread the cost of, and retain, the training resource as an alternative or supplement to face-to-face classroom training.

The Hoskyns Group, based in Melbourne, released a cbt package last year covering the communications field. Developed in the UK by Hoskyns subsidiary, Computer Based Training Ltd, the package comprises 15 training disks and three test-your-knowledge disks. It has a comprehensive manual that provides course guidance and substantial appendices that cover such things as CCITT recommendations definitions, the roles of the various standards bodies, modem characteristics and a glossary of terms that will extend the most avid technocrat's lexicon.

The training disks cover more than 40 hours of material, organised into four modules of three to four lessons each. While the professional electronics engineer might find the treatment of the material somewhat superficial, for staff with a communications responsibility within the information systems department of an organisation, the introduction to concepts is excellent.

Quizzes allow student to review progress and at the end of each module, the test disk reviews the student's absorption of the lessons.

Students may leave a lesson at any point at their discretion. The system will maintain a "bookmark" to facilitate returning to the point at which the student left off, otherwise a lesson must be started again.

The package includes an introduction to transmission and protocol concepts, the various physical and electrical aspects of communications, a substantial section on local and wide area networks, as well as a detailed look at Open Systems Interconnect (OSI).

Textual matter is well supported by "motion" graphics that provide pictorial reinforcement of the concepts.

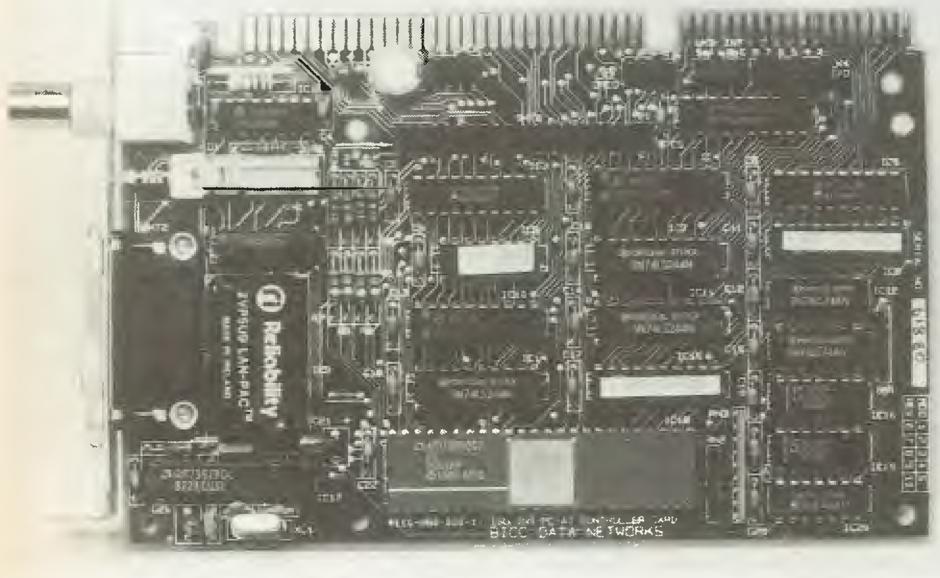
The structure of the package is more informative than academic in so far as there is no formal control over the progress of a student through the course. The quizzes and tests do highlight the areas where the student needs to review the subject matter. However, progressing to another lesson or module is not hindered. This also holds true if a lesson is abandoned, although a prompt at the lesson menu will highlight the lesson's incompletion should that lesson be revisited.

The disadvantage of the lack of interaction with a "trainer" — the human touch — perhaps to expand on some fine point, or clear up a misunderstanding, is countered by the availability, portability and re-usability of a significant training resource.

The product runs on MS-Dos machines, requiring a color adapter and monitor, just 256k of memory, and a single disk drive. It is also supported in the more popular network environments, Hoskyns claims.

For product information, contact Hoskyns Group Plc, in Sydney (02) 959 1904, or Melbourne (03) 813 3944.

Ethernet controller cards from Austral Data



Austral's PC controller card

AUSTRAL Data Networks has released two high performance Ethernet controller cards, the Isolan AT and Isolan MCA controller cards, for professional networking.

Targeted at the IBM PC AT and PS/2 MCA markets, the cards employ a 16-bit architecture. In controlled tests with Novell Netware, single station throughput of 527k-bytes/sec and server throughput of 1060k-bytes/sec was achieved — the highest performance attainable on Ethernet.

The Isolan cards are designed to provide large integrated systems within multiple operating systems, providing an answer to high file transfer rates in large networking systems. The cards enable the integration of mini and mainframe connections utilising MPS, which was pioneered by Bicc Data Networks.

In conjunction with MPS, the cards present a powerful multi-tasking controller, offering connectivity options which would be otherwise unattainable. MPS allows transparent communication between an IBM PC or compatible and, for example, a DEC Vax, mainframe and 386 servers. MPS provides a choice of communications between NetWare, PC-NFS, PC-TCP and MS-Net allowing simultaneous operation on the same workstation.

The MegaPACE_E, OSI network processor

Processor fills a product gap

JN Almgren Pty Ltd (JNA) has introduced the MegaPAC_E OSI network processor, filling the product gap between the MegaPAC_V high powered X.25 switch and the MegaPAC_J medium-performance economy switch/Pad.

The company said the MegaPAC_E was designed to meet the switching, concentration and access (Pad) requirements of small, medium and large organisations. Terminals, hosts, controllers and other data-processing equipment from different vendors could be supported on MegaPAC_E in such a way that complete network integration was easily achieved, and telecommunication line costs minimised.

JNA said MegaPAC_E out performed comparable X.25 packet switches as, in addition to its price performance attractions, it also supported an enhanced user interface.

The presentation service, as it was known, could selectively provide a menu of available resources for locally and remotely connected users.

In this way, familiarisation was kept to a minimum, and complex procedures were eliminated. The presentation service also operated a queuing function for busy resources, and additionally supported the ISO transport protocol for multiplexing within logical channels.

For example, its sophisticated IBM SNA support allowed IBM devices to be connected efficiently on an X.25 network. As well as operating with IBM controllers (such a 3174) and frontend processors (37XX) via native SNA SDLC, MegaPAC_E supported IBM's X.25 implementation with QLLC and NPSI.

The spokesman said the MegaPAC_E also offered a builtin network management facility which provided local or remote control. Each MegaPAC_E generated reports, statistics and billing records for the network manager. All reports, commands and records were fully compatible with other processors in the MegaPAC family, including the central network management system. Installing a MegaPAC_E in an existing MegaPAC network required no extra operator training.

JN Almgren Pty Ltd, 16 Smith St, Chatswood Tel: (02) 406 6177.

Usernet2 raises security of Lans to that of mainframes

RAISING the level of local area networking (Lan) security to mainframe levels, Unisys has announced the latest release of its Lan product, Usernet2. The new version, Usernet2/286 NetWare 2.11 offers System Fault Tolerance (SFT) and is a Unisys value-added product sourced from Novell.

Available with or without SFT, the new version adds much greater functionality, security and stability to the product. Because Usernet2 uses the 80286 in its protected mode, it can address large amounts of Ram to extend processor efficiency and system performance.

In its SFT version, Usernet2 allows the use of mirror-imaging of disks for continuous uptime in case of a disk or disk controller failure. Security is further enhanced by the Transaction Tracking Facility (TTF), which helps to overcome data corruption in the case of a power failure. Usernet2 SFT may also use uninterruptible power supplies to do an emergency power down in the case of mains power failure.

Usernet2 with SFT raises the level of Lan security to mainframe levels by enhancing the login system to allow supervisors to grant access to specific areas of files at specific times from specific workstations. Also new is the ability to charge users of departments for Lan access and data storage.

One of the main security benefits of Usernet2 is its formatting of its hard disk drives so that it is impossible to access a Usernet2 drive through Dos.

The package includes as standard a fully functional electronic mail facility, an option on almost all other systems.

Among the optional value-added features from Unisys are multiple Uniscope/DCA, Poll/Select, Async and IBM 3270/3770 SNA emulation sessions through communications servers.

A further enhancement is the use of disk co-processors to extend the disk capacity of the data/print server, giving a total external capacity of 1.72 gigabytes per data/print server.

The disk co-processor also relieves the data/print server of the processing overhead normally associated with large disk drives. In a Usernet2 SFT environment, four disk co-processors may be used, in mirrored or duplex configurations. Multiple data-print servers and communications servers are supported on each Lan.

An upgrade to Usernet2/286 NetWare 2.11 is available for existing Usernet and Usernet2 users.

PRODUCTS & SERVICES

Voca completes its phone range, adds fax machine

TELECOMMUNICATIONS company Voca Communications Pty Ltd has launched another feature telephone on to the expanding Australian telephone market. Voca's newest midrange model, the Voca ADX27, completes the ADX handset range.

Features of the ADX range include 30 number memory, on-hook hands-free dialling, re-dial, re-dial save, electronic hold, multiple ringer volume control and ringer tone, chain dialling, earth/flash key, and a pause facility. Furthermore, all models are fully compatible for use on switchboard extensions and can be wall-mounted if desk or bench space is limited. The midrange ADX27 also features a hands-free speakerphone.

Voca also has released a new base model facsimile machine — the Voca-fax M1200. The M1200 performs three functions in one compact unit. With its builtin handset, it needs only a telephone line to operate. It sends and receives documents, can be used as a normal telephone or can make clear copies of documents when a photocopier is unavailable. This model weighs only 4.2 kg, making it fully portable and provides a communication link in the office, home or wherever a telephone line is available.

Not handicapped by its compact size, the M1200 can transmit documents up to 254mm (B4) wide and receive documents up to 216mm wide. Transmission time is just 18 seconds for an A4 page. The M1200 is fully compatible with any Group 2 or Group 3 facsimile machine, and features comprehensive activity reports to monitor usage and a Transmit Terminal Identifier which automatically prints the user's name, phone number and date at the top of each transmitted page.

Voca Communications Pty Ltd, 11-29 Eastern Rd, South Melbourne, Vic 3207. Tel: (03) 697 7000.

*THE Voca-fax M1200 **portable** facsimile machine. Ideal for the home or office, **the** M1200 is a fax, phone, and copier in the one unit. The compact unit sells for $1799*

Case time division multiplexer

CASE Communication Systems has announced the latest addition to its Meganet 7000 Series product line with the release of the Case 7410 Time Division Multiplexer.

Designed to exploit the capabilities of high-speed, digital-leased circuits, the Case 7410 is a Time Division Multiplexer (TDM) for MegaLink or equivalent 2.048M-bit/sec circuits, offering up to 30 channels per trunk. Each channel operates at 64k bit/sec and can carry either data or pulse code modulated voice.

The 7410 provides for both Common Channel Signalling (CSS), which is a standard now being endorsed by PABX vendors, as well as analogue E & M signalling for users of older PABXs.

Current examples of CSS are, Digital PABX Network Signalling System (DPNSS), Digital Access Signalling System 2 (DASS2) and CCITT No 7.

The 7410 supports up to 4 Megaband trunks per node and is suited for multinode networks.

Voice channels can be connected on an individual basis, or via a lost cost bulk interface direct to the PABX, which is both cheaper and simpler to instal.

Up to 30 voice channels per digital trunk can be connected with any unused channels available for data input/output or onward linking.

Sub-rate multiplexing of the data channels can be achieved for even greater line utilisation by employing Case DCX statistical multiplexers for asynchronous traffic or the recently introduced Meganet 7150 Time Division Multiplexer, for synchronous traffic.

Configuration and diagnostic procedures for the 7410 allows for re-mapping of the channel allocations and routing in the event of high-speed trunk failures or to take account of the need for a mix of voice and data at different times of the day.

Case Communication Systems, 12 Rodborough Rd, Frenchs Forest. Tel: (02) 451 6655.

Australia gets MacBlast package

A DATA communications software package for the Apple Macintosh II, SE and MacPlus has been released in Australia. Called MacBlast, the software is said to "present users with the same friendly screen instructions that have made the Macintosh so popular". It is the latest addition to the Blast (BLocked ASynchronous Transmission) software for computer-to-computer communications from US developer Communications Research Group. It is being distributed in Australia by Mini Computer Systems Pty Ltd, Melbourne and Brisbane.

MacBlast offers fast, error-free asynchronous data transfer between a Macintosh and more than 30 other major mainframe, minicomputer and PC systems so that any computer with MacBlast can talk to any computer running a Blast program. Blast sends and receives data simultaneously and resumes transfer at point of interruption rather than the beginning of file, if disconnections occur.

Macintosh conformity

Systems supported by Blast include the full Data General and DEC ranges, Burroughs/Unisys, AT&T Unix, SCO Xenix, Wang VS, NCR Tower, Hewlett-Packard, Prime and Harris Lanier as well as PCs, PS/2s and compatibles. MacBlast conforms to the Macintosh screen format by using the Macintosh Human Interface Guidelines (pull-down windows and popup menus) and it has the features of other Blast II products including data compression, auto call to remote locations, password protection and a script language which allows automation of any task to one keystroke.

Mini Computer Systems, 411 Hawthorn Rd, South Caulfield, Vic 3162. Tel: (03) 528 2711.

Features added to winning FastPath 4

TRI Data Corporation Australia has introduced new features to its Kinetics FastPath 4 product. FastPath 4 supports multiple network protocols, enabling Macintoshes to share printers, electronic mail services, file servers, and other peripheral devices. But unlike previous FastPath systems, the FastPath 4 introduces K-Star (Kip-style addressing and routing), which provides automated address management. K-Star enables the gateway to assign IP addresses to Macintoshes on a LocalTalk network. The IP addresses are necessary for communication with an Ethernet host speaking TCP/IP.

The FastPath 4 also has new diagnostic features, including a set of lights that indicate the direction of network traffic, helping network managers track down problems such as disconnected cables David Murray, marketing manager for Tri Data said.

"We believe that a big plus for the FastPath 4 is its adaptability. It is designed to meet the needs of both the smaller networks and the giant, growing internetworks that include Macintosh. And, while earlier versions of the FastPath came in two models, one for thin Ethernet and another for standard Ethernet, the new product has both thin and standard Ethernet connections. Another definite plus for the FastPath 4 is the increase in memory from 48k to 256k (expandable to 512k), and a faster 68000 processor," Tri Data has focused on system software products and consulting services in a range of environments that include DEC, Prime Status, Unix, Data General, IBM PC and Apple Macintosh.

Tri Data. Tel: (02) 953 8577. Fax: (02) 953 0127.

stepping up

From left: Phillippa Lenehan, Alan Khoo, Richard Ski

Stewart Jamieson has been appointed communications consultant in the Melbourne office of Sourceware, national PC products distributor.

Jamieson will be responsible for assisting with the distribution of Sourceware's communications products which include the Tapestry, IRMA, SmartAlec and Crosstalk ranges.

He was formerly with BS Microcomp, one of the largest PC dealers in Australia, for three and a half years. With this company he served as account manager and then as marketing analyst.

He has also had experience in the PC divisions of Sands Business Systems and Myer.

Philippa Lenehan has been appointed to the position of manager, market research in the business operations division of OTC.

Kevin McDonald has joined BIS Shrapnel Pty Limited as a senior consultant in the company's Melbourne office.

McDonald worked for some years with BIS Shrapnel's sister company, BIS Mackintosh Ltd. His main task in Australia is to continue the development of BIS Shrapnel's research activities in information technology.

He has previously been involved in the creation and conduct of a number of international market research studies focusing on telecommunications and computer systems.

She co-ordinates OTC's major research projects which include analysis of telephone usage and segmentation, new product opportunities, customer profile information and the testing of corporate advertising.

Lenehan holds a BA (psychology and English majors) from the Universtiy of Sydney and is completing a graduate diploma in marketing. Her previous position was project executive at Amatil Limited

INTERFACE Technology of Australia has appointed ***Richard Ski*** director of sales to head its new product developmennt and evaluation program, and implement sales and marketing strategies.

His duties will also include supervising telemarketing, and training and development schemes.

Ski, 39, was previously business manager, market development group, with Fujitsu Australia where his achievements included establishing a dealer/value added reseller network for a variety of new products.

Alan Khoo has been appointed to the position of network system engineer.

In addition to networking and application technical support, Khoo will also be responsible for research and development.

Khoo, 36, has more than 13 years experience with technology companies in Singapore and Malaysia and was most recently Engineering Manager with Australian Network Connection Ltd.

Greg Cooper has been appointed to the position of technical support engineer.

Cooper spent eight years with Datapoint Corporation specialising in system software support and recently held the position of computer services supervisor with Channel 10.

His duties at Interface Technology will include the technical service and support of the company's range of office solutions.

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In the data area, you will need to have proven experience in IBM SNA networks.

For both positions, excellent written and verbal communication skills are essential.

Salary of course will be negotiated according to your qualifications and experience, but we are looking at around $40,000 to $47,000 plus generous industry benefits.

If you are interested in applying, please send your resume in strictest confidence quoting ref. OD 904F to Peter Xenos, Westpac Information Systems, Level 18, St. Martins Tower, 31 Market Street, SYDNEY 2000.

For more detail, phone Peter on (02) 260-5563.

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For further information on this position, contact John Jacobe on (03) 829 6207.

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Duties include technical advice to ATUG staff and member companies, liaison with technical bodies, carriers and government, management of State Committees and writing short articles and reports.

Salary $35K to $45K neg depending on experience. Commence ASAP. Call Wally Rothwell (02) 957 1333.

Contact details:

Wally Rothwell
Executive Director
Australian Telecommunications Users Group
PO Box 357, Milsons Point, NSW 2061
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INTERRUPT

Robertson's law pulls the plug on Parkinson's law

LUNCHTIME on Monday in the XAB Corp's canteen.

Jack: No doubt about it, Max. No doubt about it. Talk about a palace revolution. The whole top floor is empty. The corridors of power are as silent as a graveyard at midnight.

Max: Yeah. Just been up to the kingdom. Kinda spooky. Filled to the walls one day with people and now the only life is the pot plants — and they're artificial. Just desolation. All those PCs sitting on the desks for all the world like tombstones.

Jack: I've seen a few things in my life . . . but this just takes the cake. Just blasting everyone out the top floor like that as if they were shot from a field gun. Bloody remarkable. I hope everyone had a happy landing.

Max: From what I've heard the firm's been pretty generous. Enough for them to cruise on while they pick themselves up and dust off their clothes and start looking for another job.

Jack: The shock must have been the greatest thing. Fancy coming back all fired up from a Friday lunch, feeling all's sweet with the world and looking forward to the weekend and then . . . powee.

Max: Rather brutal wasn't it. General announcement by that old fogey, the chairman . . . yeah, Fergie. According to Meryl . . . I rang her over the weekend . . . Fergie just drags a chair to the middle of the floor and shouts: "May I have your attention please ladies and gentleman. The company is in a parlous condition. Your services are no longer required. Please clean out your desks and see me on your way out. Myself and the board thank you for your past services and wish you well in your future careers. Thank you." Then he gets down off the chair and just waddles off.

Jack: What a way to go.

Max: Yeah. Meryl said everyone just stood there for about 30 seconds like stunned mullet and then the smart ones just scrambled for a telephone to ring up their contacts to see about a job and then the whole place just folded up like a pack of cards. Everyone gone in an hour. Meryl said there was a terrific wake that night and when I asked her what it was all about she said no one had the faintest clue. She thought the board must have flipped their lids or been on a trip or something.

Jack: They've been on a trip alright.

Max: What'd ya mean, a trip?

Jack: A trip down memory lane.

Max: Have you flipped too?

Jack: Na. Too much of a coincidence. Have you noticed an old geezer, and I mean old . . . must be 90 at least . . . riding the lifts in the last couple of weeks. Used to turn up here at anniversary parties and then dropped out of sight, forget his name.

Max: Yeah. I used to see him. Believed he retired in the dark ages . . . about 30 years ago. Son of the founder. What's his name . . . Robertson . . . Yeah, Snake Robertson, went for the jugular every time.

Jack: Well, I bet he's behind all this. Hullo Pete, what's the hurry.

Pete: Heard the latest?

Max, Jack: No.

Pete: A bloke outa the ark, Robertson, is sitting in the middle of the kingdom upstairs and calling everyone in and asking them what they do and how they do it and saying there's going to be big changes and how do they like it . . . or, if they don't. just lump it.

Jack: What changes?

Pete: I tell you, he's out of the ark. Roy's just been up to see him and he tells Roy the company's gone full circle and we're going back to the beginnings and . . .

Max: What beginnings?

Pete: Let me finish, will you. Roy says he tells him the board has stumbled on to a modern variation of Parkinson's Law . . .

OFF LINE BY NOEL BENNETT

Jack: Who's Parkinson?

Pete: I don't know . . . some old dingbat I suppose. Well he tells Roy that work expands according to the technology available and it always ends up with making work for work's sake.

Max: It's over my head.

Jack: Passed me by five minutes ago.

Pete: Well, he tells Roy that this Parkinson said that work expands according to the time available for its completion and then he points to a PC on a desk and says something about it being extremely useful, but you have to watch carefully how it's used. Or something like that.

Anyway, Robertson says people do a lot of work with the PC just because it's there which they wouldn't do if it wasn't there and most of the work they do isn't really necessary and it's only done because it's there.

Max: Mumbo-jumbo. Just mumbo-jumbo.

Pete: No, Roy doesn't think so after Robertson pointed out an example. He said to Roy, how much debt would he have racked up if credit cards weren't available and he had to pay cash for everything?

Max: That makes sense.

Jack: Too painful to think about.

Pete: And then he tells Roy that it's the same way with office technology. You often use it just before it's there. You send a memo because it's easy to send one through the e-mail system. It doesn't matter whether the memo is necessary, you just send it because the technology's there and every one gets bogged down in petty nonsense.

Roy says his mind is as keen as mustard and he's bloody spry for his age.

Max: It's all clicking together. The stupid memos I get . . .

Jack: And send. I wonder how he's lived so long.

Pete: I asked Roy that, too. He said the rumors are that when he retired, he got stuck into chess, majored with honours in classical philosophy at some university or other and played bowls.

Jack: And now he's back in the top job.

Max: So much for career training.

Pete: And do you know his proudest boast?

Jack: Haven't the faintest.

Pete: Rumor says that he claims he's never been to a management course.

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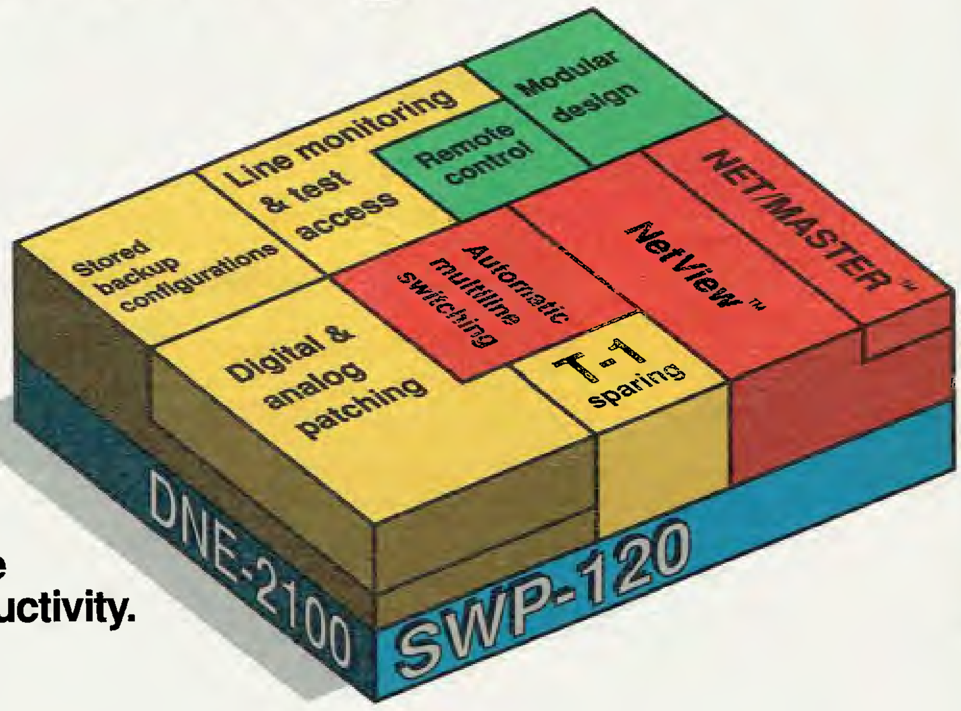
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NEWS

Infotron sales expanding in Asia/Pacific

By Noel Bennett

SYDNEY — Infotron Systems Corp intends that its Australian operation participates in the accelerating demand for communications equipment and support in the Asia/Pacific region.

The president and chief executive officer, Dr Jim Castle, noted that last year's revenues of the New Jersey-based high-speed network equipment provider were split about equally between its home country and abroad.

By 1991, this mix was expected to be split evenly between the US, Europe — with the coming of the integrated European Community in 1992 — and Asia/Pacific.

The Australian operation, Infotron Systems Pty Ltd, was formed in 1986 as a joint venture between Infotron of the US and Techway Ltd. In November 1988, Infotron Systems brought its shareholding in Techway Pty Ltd up to 90 per cent. The remaining 10 per cent is held by staff members of Infotron Systems Pty Ltd.

Castle said communications was now a global business and the Australian operation would provide support, be a parts depot and perhaps engage in board repair for its operations in the region, including New Zealand, Thailand, Indonesia, South Korea and Taiwan. It would, of course, market vigorously in Australia, a "large" market.

Castle said the corporation was now providing new products for the "exploding" Lan market, driven by desk-top computing, with interest by corporations in the interconnection of geographically disparate sites also stimulating the business for Lan to Wan connections.

Castle said customers also required much faster transmission speeds to cater for the Cad and Cae applications. Also, video networking was coming to the fore.

Large businesses, particularly in the banking and financial services markets, were implementing very sophisticated communications strategies.

Castle said experience with deregulation in the US and UK had revealed that most network usage was strategic, customers required complete resiliency in their networks and accordingly, full service and support was essential, internationally.

Further, customers required a complete solution to their needs from the one vendor and were not interested in the singular "black box" approach.

Infotron Corp's revenues for the first nine months of its present financial year were the highest in its history — $US70 million, up 18 per cent on the previous year's results.

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Local Loop

Decision delayed

MELBOURNE — While NSW is still a long way from deciding who will provide the telecommunications infrastructure for departments and instrumentalities, the Victorian government's already-implemented Vistel Network is to introduce the Telecost PC voice mail system.

The vendor said voice mail's benefits had been known for some time in the US, but the technology had been slow to gain general acceptance in Australia. The Vistel placement is seen as an important step in the marketing of these systems here.

Absence noted

SYDNEY — Perhaps it is the cold weather in Beijing during November that has deterred Australian official and private participation in Expo Comm China 90. National Pavilion sponsors include: China (naturally), Japan (more than naturally), the US (the Japanese are there . . .), France (in keeping with its mission to civilise the world), West Germany (perhaps it wants to engage in further ISDN trials), Italy (to show off its superior product design abilities), Canada (trying to sell excess capacity on its satellite systems?) and Poland (to squash any damaging joke-telling).

The exhibitors are also from all over the world.

On a serious note, considering the trade missions, and speeches galore made about promoting China-Australia trade, would it not be in our interests to be represented there? There is still time.

Researchers busy

MELBOURNE — Siemens has joined with Telecom in a six-month joint study to identify the key hardware items which could become integral to Australia's telecommunications networks in the 1990s.

Upon their identification, the researchers will determine the feasibility of local manufacture. The study anticipates the finalisation during 1992 of international standards for the new Broadband ISDN, an optical fibre-based network said to allow transmission speeds of up to 140M-bits/sec. according to Telecom Researcher.

Marine service spreads

ADELAIDE — Following its first introduction in Sydney during early 1988, OTC is spreading the Auto Seaphone service, South Australia being the latest link in the intended around-Australia chain.

The new automated service is said to allow easier and faster telephone communications between mariners and friends and business associates ashore.

The service has been developed in Australia to OTC's specifications by Heyden-Spike with the unit costing as little as $249 to instal if it is connected to a vessel's existing VHF radio equipment. The system can be used to direct-dial anywhere in the world and other features include recorded voice announcements and a Dial 999 emergency hotline.